MOVING GOODS AND DELIVERING SERVICES

DEVELOPMENT OF A REGIONAL TRANSPORTATION PLAN FOR THE GREATER TORONTO and HAMILTON AREA

FOR CONSULTATION

metrolinx

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A Message From the Chair

February, 2008

Rob MacIsaac
Chair, Metrolinx

Developing a comprehensive transportation vision for a large, diverse urban area is obviously a complex process. In undertaking this enormous task, Metrolinx is looking outwards for insight and advice by:

- Consulting with a wide cross-section of people and organizations; and
- Examining as much data as we can to learn from trends, best practices and experiences in our own and other jurisdictions.

It is in the latter category, studying data, that the issue of moving goods and delivering services — the subject of this, the fifth in our series of Green Papers feeding into the Regional Transportation Plan (RTP) — presents some unique challenges. Unlike other aspects of the RTP, there simply is not a large body of information available.

This lack of cohesive data is a function of the dominant role private enterprise plays when it comes to transportation for commercial purposes. For competitive reasons, private companies are reluctant to share information about their operations. As a result, we do not have a clear picture of exactly who is moving what, where and when.

What we do know is this: commercial transportation is vital to our economy. Railways, truckers, and bicycle couriers all contribute to our economic well-being.

At the same time, we have to recognize that commercial transportation has an impact on our quality of life. Too much commercial traffic compounds environmental and congestion problems — particularly when market pressures take precedence over social considerations.

We also have to recognize that the system must work for everyone. Transit riders, drivers, cyclists and pedestrians need to co-exist with commercial traffic in a limited amount of space. Even the rail lines in the Greater Toronto and Hamilton Area (GTHA) are experiencing congestion, such that commuting and freight operations are having an impact on each other.

Because this subject is relatively new territory for us, it presents a great opportunity for innovative thinking. It also means that our consultations take on heightened importance. We are eager to hear your ideas.

Whether you are a commercial operator who depends on an effective transportation system to serve your customers or a consumer whose demands influence commercial decisions, you play an important role in striking the right balance between economic, environmental and lifestyle concerns.

As with the other Green Papers, we want to hear from as many people as possible about what they think will or will not work as we consider options for improving the way we move goods and deliver services.

We want to know how much flexibility needs to be built into the transportation system. We want to know how consumers might influence business decisions related to transportation. We are looking for ideas on how to get people and companies working together, without compromising competitiveness, for the benefit of everyone.

The more input we get, the better we will be able to determine what approach to take, not just for moving goods and delivering services, but for every component of the RTP.

Ultimately, our goal is to do a better job of planning and funding infrastructure decisions to make sure the transportation system is coordinated, seamless and sustainable across the region.

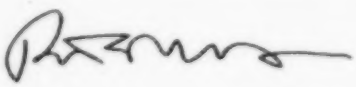
This is a tremendous opportunity with tremendous benefits:

- We can make this a more liveable region by improving people's mobility and giving them more personal time;
- We can position our economy as a strong competitor on the world stage by making sure that businesses get their supplies and their products to market with ease; and
- We can protect and enhance our environment by reducing greenhouse gas emissions and reducing the impact of pollution on our air, water and land.

Achieving these benefits will not be easy. It is going to take leadership, planning, cooperation and determination. Most of all, it is going to take thoughtful consideration, based on realistic, pragmatic information.

That is why we need your input — to make sure our vision for this region's transportation system, including moving goods and delivering services, will meet your needs.

Thank you for taking the time to read and comment on this Green Paper. We look forward to receiving your views.



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Executive Summary

To understand the importance of commercial traffic to the economy of the Greater Toronto and Hamilton Area (GTHA), consider this small sampling of information:

- Commercial trucks make about one million trips each day in the GTHA;
- At its peak, Highway 401 handles about 36,000 truck each day;
- Canadian National (CN)'s Brampton Intermodal Terminal is the largest of its kind in Canada;
- The Port of Hamilton is the largest port by cargo volume on the Great Lakes; and
- Toronto Pearson International Airport handles over 500,000 tonnes of cargo annually.

All of this road, rail, air and marine traffic represents a significant contribution to our economic prosperity. On the down side, it also contributes to congestion, noise and pollution. As Metrolinx develops a Regional Transportation Plan (RTP) — a long-term vision and strategy to improve transportation choices — finding the right balance between commercial, community and environmental needs will be an important challenge.

To create a more sustainable future, we must find ways to ensure that:

- the transportation system operates efficiently;
- conflicts between freight and passenger demands on the transportation system are minimized; and
- goods movement and service delivery and associated facilities are compatible with the types of communities in which we want to live.

This Green Paper aims to clarify the key issues around goods movement — the nature and magnitude of goods movement and service delivery, the roles and responsibilities of various stakeholders, and the opportunities to respond to major challenges.

COMMERCIAL TRANSPORTATION – WHO AND HOW

In addition to freight transport, it is important to include all the movement of people and goods that are required to deliver a vast array of commercial services, such as appliance repair, parcel delivery and waste collection. These deliveries are accomplished through a complex network that includes moving raw materials into processing facilities, semi-finished goods to factories, and completed goods from factories to distribution centres to regional and local stores. At the local level, suppliers take products that are brought into the region and use them to create new products and services that are, in turn, shipped out for the local and export market.

Decisions about how this complex network is used are based on a wide variety of factors. Private sector shippers, receivers, contract logistics services providers, and consumers exchange goods and services through a vast combination of arrangements. Price, transit time, reliability of service, availability of service, response time, and ease of doing business usually rank among the top selection factors. There is no single, or even standard, combination of factors. The match of supply to demand is a somewhat arbitrary process guided by market forces.

Unlike passenger travel, social attitudes and preferences traditionally do not factor into goods movement. Decisions on the mode to be used for shipments tend to be dominated by time and cost considerations.

MAIN COMPONENTS

Trucking

In terms of both tonnage and value of intercity goods movement to, from and within the GTHA, trucking is by far the most common mode of transportation. In 2006, trucks transported 68 per cent of Ontario's export value and 84 per cent of the province's import value.

Longer-distance movements are dominated by large tractor-trailers whereas intra-urban goods movement is carried out by a range of small, medium and heavy trucks. Because of the short distances involved and linking of trip deliveries, trucks will likely continue to be the predominant mode for this category of movement for the foreseeable future. These urban truck trips will contribute to, and be affected by, growing traffic congestion on the region's roads and highways.

Rail

The GTHA is primarily served by the two main rail freight systems in Canada: CN and Canadian Pacific Railway (CPR).

Rail is primarily used for long-distance bulk and intermodal movements. The extra time and costs of rail shipping for pick-up and delivery, usually by truck, means that rail movements are not viable for most shorter distance (less than 800 kilometres).

Intermodal

Intermodal freight is defined as a movement which is carried by more than one mode. The most familiar example is the transfer of cargo in containers or trailers between rail, marine and road modes.

Major truck-rail intermodal terminals include CN Brampton Intermodal Terminal, CPR Vaughan Intermodal Terminal, CPR Obico Intermodal Terminal in Etobicoke, and the CPR Expressway terminal near Milton. While data on the traffic handled at each of these facilities are guarded as commercially confidential, it is estimated that Brampton, Vaughan and Obico terminals together attract about 6,000 truck trips per day.

Currently, there is very little intermodal container traffic handled by marine ports. Modern container ships do not generally enter the Great Lakes as most are too large for the locks of the St. Lawrence Seaway.

Marine

There are four main ports in the GTHA: Hamilton; Toronto; Mississauga/Clarkson; and Oshawa. On a tonnage basis, these ports handle about 15 per cent of inter-city goods.

Marine is primarily used for the movement of bulk goods such as coal, iron ore and road salt. As a general rule, marine bulk traffic does not travel far inland from the port of handling and the majority of traffic is inbound.

Air

Goods moved by air tend to be light, valuable, and time-sensitive products that can absorb high shipping costs. These movements require truck transportation at the beginning and the end of the trip. By their very nature they are intermodal. In 2004, the top products shipped by air were machinery, electrical equipment, aircraft and transportation equipment.

By far, the most important airport in terms of Canadian goods movement is Lester B. Pearson Toronto International Airport. This airport is the largest air cargo hub in Canada, handling 70 per cent of the air cargo traffic in the Quebec-Windsor Corridor, and 45 per cent of all of the air cargo traffic in Canada. John C. Munro Hamilton International Airport is also significant in that it is the largest integrated courier cargo airport in Canada. One of the key attractions of Hamilton International Airport is its 24-hour operation.

Active Transportation

Although small in terms of the amount of goods moved, bicycles and walking are important methods of moving goods. For example, bike couriers and "on-foot" couriers are becoming more important in downtown areas where they provide much faster delivery times than vans or cars. One of the most familiar examples of goods movement by active transportation is mail delivery by walking postal workers.

Government

Governments at all levels are key players in commercial transportation:

- The federal government's role in the transportation of goods involves the regulation of airports, railways, ports and international border crossings where it has overall jurisdiction. The federal government also regulates fuel options and harmful emission standards for vehicles.
- Provincial regulations tend to focus on road operations, including weight, size and speed restrictions.
- Municipalities are concerned with impacts related to specific movement of transportation vehicles within local boundaries. This can include such things as noise limits from train whistles and airplanes to the use of engine retarder brakes by truckers.

In addition to legislation specifically targeting the transportation industry, all three levels of government are involved, to some degree, in land-use regulations. The location of industrial, commercial and residential projects can have significant impacts for goods movement.

KEY ISSUES

Social Impacts

While important for economic prosperity, from the public's perspective, goods movement is also associated with noisy and somewhat intimidating trucks operating on highways and through residential areas. Goods movement can also evoke concerns about large intrusive land uses and safety over spills and collisions.

Most of the social concerns related to goods movement and service delivery arise from the fact that goods movement and communities overlap in urban areas. In well-established areas, people and goods movement activities must compete for both land and infrastructure.

Long-term strategies for moving goods and delivering services must address quality of life and environmental sustainability objectives, while ensuring continued economic growth.

Land Use

While much of the industrial land use and associated transportation infrastructure in the GTHA is well-established, the needs and impacts of goods movement, when it comes to land use planning, must be considered. This means avoiding new residential development that is encroaching on or is in close proximity to track rail, marine, and air terminals as compatibility and expansion problems may occur.

Infrastructure Decisions

Most options related to improving goods movement involve an extensive commitment of financial resources. Therefore, assessing major infrastructure improvements in terms of their net benefit is a major challenge. For example, is it preferable to construct a new highway for trucks or to invest in improving transit facilities so that existing routes are less congested? Very few infrastructure initiatives in other jurisdictions appear to have calculated these trade-offs, instead focusing exclusively on project-specific economic benefits. One task of the RTP will be to coordinate recommendations on freight transportation infrastructure with transit infrastructure, and vice versa.

Railway Ownership

Passenger and freight trains generally share the same infrastructure — in some cases, single railway track lines. This may be efficient in terms of minimizing infrastructure costs, but, in many cases, it causes problems because of the interaction of the two types of trains. Passenger trains may have to wait for freight trains. They also cannot travel at full speed because of being blocked by freight trains. As a result, the full potential of inter-city passenger services is not achieved.

There have been suggestions to rationalize the use of the railway networks of southern Ontario between freight and passenger services, so that freight services can be concentrated on certain lines and passenger services on others.

A major problem that exists is the ownership of the rail infrastructure by private companies. A rationalization of rail movements would require complex changes to the control and ownership of corridors, although there are many examples of CN and CPR sharing the same tracks.

Technology

Competition in the goods movement industry drives the adoption of technology that improves productivity by individual operators. For example, Global Positioning Systems (GPS) — now becoming common in passenger vehicles — have been in use for commercial purposes for well over a decade.

Most examples of the use of technology relate to generating and communicating real-time information to freight transport companies and drivers/operators.

Technology has also been used extensively to optimize loads for shipping, but largely on an independent shipper/carrier basis. There is significant potential for technology to enable even greater opportunities for load consolidation if information on shipments could be shared.

Many trucking companies now use GPS to keep track of their vehicles; however, this information is usually kept within the company and used for operational purposes. Real-time information on truck movement could be useful to a broader public by permitting decisions to be made on routes, pick-up and delivery scheduling, and other activities.

Simulation software has also been developed to assist companies with locating their facilities optimally. This would help to reduce the cost of serving their existing and potential customer base. Routing software is routinely used by large shippers and logistics companies to optimize deliveries, matching the right vehicles, merchandise, time, route and sequences.

In addition to improvements in information technology, there are also innovations being made in vehicle and infrastructure design. Today, trucks are more fuel efficient than in the past and can be expected to continue to improve. The Canadian railway industry has made major strides in reducing fuel use while increasing tonnage by introducing new fuel-efficient locomotives and improvements in train operations.

Pricing

Firms dependent on goods movement tend to locate themselves where they are able to minimize their capital and labour cost. Unfortunately, the cost, as seen by decision-makers, does not necessarily include external factors such as congestion, noise and other nuisance impacts (e.g. greenhouse gas emissions, etc.). In general, environmental costs such as the consumption of new land for facilities, roadways and emissions generated from more, rather than fewer, trips are not intrinsic to goods movement decisions.

There is a need to get the price signals right. This could be as basic as finding ways to let consumers know the full transportation costs of their purchasing choices or as complex as making users pay for the use of the transportation system, including externalities such as emissions, noise and congestion. Conversely, consideration could be given to the possibility of off-setting these costs with reduced taxes or other financial incentives.

MOVING FORWARD

One of the key impediments to developing effective goods movement strategies is the lack of knowledge of goods movements and service deliveries, particularly those operating within the urban areas. We really do not know the timing, length, origin and orientation of trips.

Operating companies know where their own vehicles are moving. Many use GPS systems to have a constant monitoring of the position of their vehicles. For the future, this offers the potential for a more comprehensive use of this information through various mechanisms of pooling and sharing.

Improvements in data collection must be a joint effort between the public and private sectors. There are recent examples of using technology to collect data in a manner that protects private interests. It is these types of initiatives that have the greatest potential for success.

Integrating environmental and social measures with the economic mission of goods movement activities will be an evolving process. Confidence and trust among participants needs to be established. That is why the emphasis in this Green Paper is to get involved in consultation processes to find the common grounds to move ahead.

Clearly, the RTP must find ways in which to bring together stakeholders though processes that overcome competing interests, find common ground between environmental and business interests, and, ideally, stimulate initiatives at the local level by participating in risk-sharing for innovative solutions.

WE WANT YOUR INPUT...

To participate in the Regional Transportation Plan consultations, please visit our website at:

www.metrolinx.com

You can also get in touch with us by fax, e-mail or regular mail:

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1 Introduction

1.1 The Need to Address Goods Movement

The smooth movement of goods and delivery of services in the Greater Toronto and Hamilton Area (GTHA) are important factors to establishing the regions overall economic competitiveness and prosperity. The GTHA is the most significant generator of goods movement activities in Canada. Moreover, the GTHA represents the third largest concentration of industrial floor space in North America (only Chicago and Los Angeles have more). It is estimated that in a single day, there are approximately one million movements by medium-sized and heavy trucks to, from, within and through the GTHA — about 10 per cent of all traffic trips. Highway 401 alone handles about 36,000 trucks per day at its peak point, many trucks of which have originated from or are destined to points in the GTHA. Annually, over 500,000 tonnes of cargo are shipped through Toronto Pearson International Airport, the majority of which are time-sensitive courier parcels. Canadian National (CN)'s Brampton Intermodal Terminal is the largest of its kind in Canada and handles more than 1,500 containers and trailers per day. The Port of Hamilton accommodates 700 vessels annually, making it the largest Canadian port by cargo volume on the Great Lakes.

Picture 1 : Goods movement and service delivery occurs through a variety of modes and on a range of scales.

The movement of goods and services is an essential part of our local and regional economies, meaning an efficient goods movement system is critical to sustaining economic prosperity. Yet, the movement of goods and delivery of services also requires the management of air emissions, noise, excessive land consumption, collisions, spills, pavement damage and increased road congestion. Attempting to balance these costs and benefits in a sustainable fashion will be integral to the goals set forth in this paper.

A key challenge in developing a plan for the future is the complexity of goods movement. Over the past two decades, trends in goods movement have been driven by supply chain management and just-in-time inventory processes. Other trends, such as globalization, free trade and an emphasis on new economy jobs (e.g. service sector) over traditional manufacturing jobs, have all had an impact on the patterns of goods movement. In the meantime, with growing concerns about climate change, energy supply constraints and border further complicate the task of developing a strategic plan for goods movement and service delivery.

Some early thinking has been advanced in this area. The province's 25-year plan, called *Places to Grow: Growth Plan for the Greater Golden Horseshoe, 2006*, requires an integrated and sustainable transportation system that moves people and goods efficiently throughout this region and beyond. The *Growth Plan* calls for the promotion of multi-modal opportunities for efficient goods movement and better integration of land-use and transportation system planning.

The creation of Metrolinx and increasing attention on goods movement among senior government officials offer an unprecedented opportunity to meaningfully address these challenges. Creating a more sustainable future means finding ways to ensure that the entire transportation system operates efficiently, that conflicts between freight and passenger demands on the transportation system are minimized, and that goods and services movements and associated facilities are compatible with the types of communities in which we want to live. The work of Metrolinx will create a comprehensive and forward-looking transportation plan for the GTHA region that is aligned with the *Growth Plan* and that will guide future infrastructure investments.

1.2 The Regional Transportation Plan

Metrolinx was created by the Government of Ontario to plan and deliver improved and comprehensive transportation for the Greater Toronto and Hamilton Area (GTHA). An immediate priority for Metrolinx is the creation of a Regional Transportation Plan (RTP) — a strategic, long-term vision for a coordinated transportation system across the entire region. The RTP will serve as a guideline for infrastructure investment decisions and a blueprint for action.

Development of the RTP includes a series of seven Green Papers as the basis of consultation on key topics including: sustainable transportation; mobility hubs; active transportation; transport demand management; moving goods and delivering services; roads and highways; and transit. These Green Papers will be followed by White Papers, then by a draft RTP. These documents will be posted on the Metrolinx website and the *Environmental Bill of Rights* Registry for interactive input from the public and stakeholders. Results from consultation with the public, stakeholders, advisory groups, Metrolinx staff and the Metrolinx Board of Directors will feed directly into the plan.

The draft RTP will emphasize balanced initiatives that ensure access by all residents and visitors to a full range of transportation choices across the metropolitan region. It will also provide a framework for transportation decisions at the local level by citizens, system users, transportation service providers and other stakeholders.

1.3 About This Paper

Most goods movement is performed by private industry on infrastructure largely supplied by governments. Transportation studies conducted by governments have not historically focused sufficiently on the subject of goods movement. This reflects both the complexity of the issues and the fact that many key factors are within the realm of the private sector. However, goods movement is important to our economy and its implications for our environment and quality of life are too great for government not to play an enhanced role going forward.

It is important to acknowledge that many issues critical to goods movement: border crossing delays, manufacturing trends, globalization and consumer habits often cannot be controlled by government policy. However, within the concept of the RTP, there is an important role for Metrolinx to work with various stakeholders to enhance the movement of goods.

This paper strives to bring clarity to key issues related to goods movement: the nature and magnitude of goods movement and service delivery in the GTHA, the roles and responsibilities of various stakeholders and the opportunities to respond to major challenges. It examines ways in which to support economic growth in the GTHA while minimizing the undesirable impacts of goods movement which arise from growth. In doing so, it attempts to help readers consider the perspectives of various stakeholders including manufacturers, shippers, governments and the general public.

1.4 Goods Movement Objectives in the RTP

Improving goods movement and minimizing associated impacts will be fundamental to the success of the RTP, which must strive to make improvements toward the following objectives:

MOVEMENT OF GOODS AND DELIVERING SERVICES – THE THREE LENSES
People
• Providing jobs • Ensuring high quality products and services are available when needed • Ensuring reasonably priced goods • Minimizing the impacts of noise and visual intrusion of goods facilities • Minimizing the impacts of goods movement on residential communities • Improving safety
The Environment
• Lower fossil-fuel consumption • Lower emissions of greenhouse gases and other air pollutants • Less community disruption from heavy truck traffic • Less space devoted to roads • Less space devoted to warehousing and storage facilities • Adoption of industrial ecology principles • Maximize safety and reduce risk of spills
The Economy
• Continued employment opportunities from a competitive industry • Continued contribution to a competitive economy and enhanced productivity • Lower-cost and more affordable goods • Reduced delays due to congestion • More efficient use of existing and new infrastructure • Reduced transportation infrastructure costs • Enhanced adaptability to energy supply risks

Table 1 : Movement of Goods and Delivering Services – The Three Lenses

2 Goods Movement in the GTHA

There are many terms associated with goods movement including freight transportation, commodity flows, deliveries, shipments and so on. Essentially, the terms "freight" and "goods movement" are interchangeable. Both terms refer to the carriage of commodities by any mode. The broader term used in this paper, "moving goods and delivering services" also includes the movement of people and goods in order to deliver commercial services, such as appliance repair, parcel delivery and waste collection.

Increases in world trade are having an impact on local goods movement

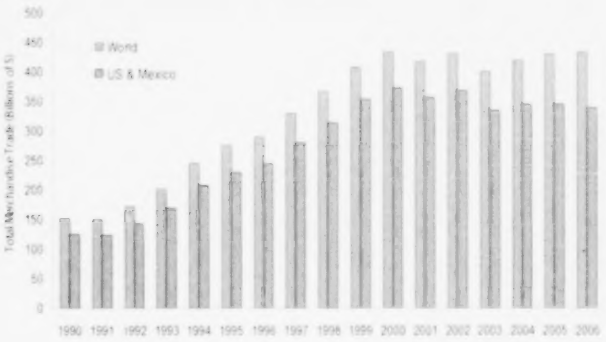


Figure 1 : Growth of Canadian Trade.

Source: Industry Canada Strategis

2.1 Trends

The volume and nature of goods movement and service delivery in the GTHA is viewed like an iceberg by the average resident. They see trucks and trains on the ground and airplanes overhead, but their focus tends to be on local and "last-mile" movements that deliver commercial goods at the local level. They are only seeing the tip of the goods movement chain. The overall supply chain of products from inception to consumption is quite complex. Raw materials are moved into processing facilities, semi-finished goods to factories, and, finally, finished goods from factories to distribution centres to regional and local stores. At the local level, suppliers take products that are brought into the region and use them to create new products and services that are, in turn, shipped out for the local and export market.

> "The fact that the Chilean grapes you served at your dinner party last night probably travelled by refrigerated container across the Panama Canal before taking a Caribbean cruise, getting onto a train, then a truck, then to the food terminal and your local grocery store, before joining you for "the last mile" in your SUV or on your bike, is somewhat of a logistical miracle that happens thousands of times every day all over the world. The fact that if you go to the pharmacy after your dinner party there is a 99 per cent chance they will have what you need is also impressive, if one takes the time to think about it".
>
> Quote from: *Integration Technologies for Sustainable Urban Goods Movement*, Report to Transport Canada's Program of Energy Research and Development (PERD) and the Urban Intermodal and Motor Carrier Branch. Prepared by Moving the Economy. 2004

More and more, a significant portion of the goods that end up on store shelves originate from areas outside of the region. For example, Canadian Tire has stated recently that 35 per cent of the merchandise sold in their stores is imported from Asia and this figure could increase to 50 per cent within a few years.

In addition to the globalization of supply chains, the methods that consumers use to purchase goods are also changing. For example, in 2005, Canadian internet shoppers ordered just over $7.9 billion worth of goods and services over the internet for personal or household consumption. Although this represents only one per cent of the $762 billion spent in this category, it is a number that is growing. [1]

Another emerging trend in urban goods movement is a move towards greater integration and "systems" thinking. Examples of how loads, destinations and vehicles are being addressed in combination include freight consolidation facilities, construction site distribution centres and consumer shipment drop-off points. Internationally, these strategies have been used to improve logistics efficiencies and decrease unnecessary deliveries.

1 Drolet, D. "U.S. lead in web shopping grew from mail-order days." Ottawa Citizen, May 18, 2007. D1.

2.2 Multiple Players in a Complex Industry

The goods movement industry is driven by competitive market forces at all levels, from around the corner to around the globe. The first layer of participants is the private sector. Shippers, receivers, contract logistics services providers and consumers exchange goods and services using just about any combination of arrangements that one could imagine. Price, transit time, reliability of service, availability of service (response time) and ease of doing business usually rank among the top selection factors for transport. Often, and particularly in an urban setting, the existence of a long-standing personal and trusting relationship between the carrier and the shipper (or receiver, depending upon who is paying the freight) is the key factor, but matching of supply and demand is guided by market forces.

Players in the Goods Movement System:

- **Order-givers**, such as large retailers, demand a service. They dictate or greatly influence terms such as arrival or departure time (through appointments) and price. Often, they do not have significant influence on specifics of the trip between origin and destination. Their operational demands can result in sub-optimal efficiency.
- **Logistics companies** coordinate logistics for their clients. They can be instrumental in improving efficiency, particularly for smaller order-givers, thanks to sophisticated tools, up-to-date fleets and their ability to consolidate shipments.
- **Service providers**, such as railroads and trucking companies, provide the actual service. The trucking industry is diverse, with a small number of large players and a multitude of owner-operators competing against each other.

Two or even all three of these roles outlined above can be assumed by a single firm, for example, a large retailer with national or continental operations.

At a high level, the public sector influences the playing field through legislation, regulations and enforcement, and taxation and ownership. Municipalities and regional governments determine the locations of where goods and services activities occur. They regulate the physical and spatial environment in which production and transportation activity takes place. They create zones for different purposes and establish truck routes, parking, time of day and noise restrictions. These local controls can have significant influences on external and regional transportation, which can then spill over to provincial and national transportation patterns. Through land use activities, they also dictate how much space is needed to accommodate pick-up and delivery operations.

The province and municipalities are crucial players in providing road infrastructure. Ports and airports are expected to be self-sustaining financially, but are largely under federal regulation and control. Railways are regulated both federally and provincially (i.e. in the case of short lines), but the infrastructure is often owned privately. This is a highly complex environment that is often plagued with conflicting policies and goals promulgated by jurisdictions with overlapping interests.

Shippers such as manufacturers, wholesalers and retailers tend to focus on their own supply chains while letting carriers and third-party service providers find their way through the maze of policies and regulations.

Influencing changes in the market cannot ignore the needs of any of these participants and experience has shown that a one-size-fits-all approach will not go far.

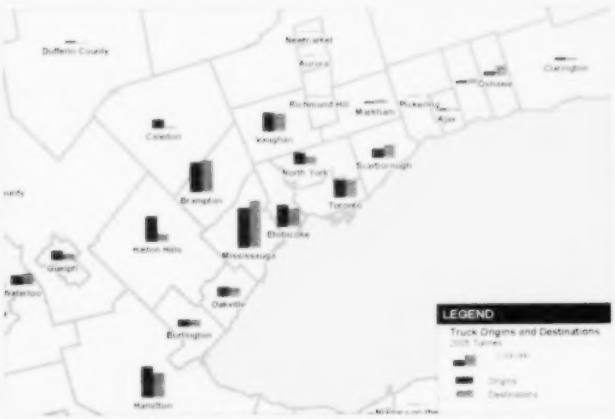
2.3 Location of Goods Movement Activities

In general, there are four types of land uses that tend to produce a higher than average number of goods movement-related trips: manufacturing and assembly facilities; warehouses; intermodal terminals and freight centres; and trucking support facilities (e.g. yards, terminals, parking and service locations). In addition, large concentrations of office and retail development, such as the central business districts and major shopping centres of Toronto, Hamilton and other centres, tend to generate high levels of goods and services activity.

Identifying the location of existing and emerging generators and attractors of goods and services activity throughout the GTHA and their relationship to existing and potential infrastructure is an important first task in the development of an RTP. Map 1 illustrates the location of some of these major nodes while Map 2 highlights the impacts of the location of these generators on long-distance trip origins and destinations.

Map 1 : Major Infrastructure and Activity Nodes.

Source: Adapted from Ministry of Transportation of Ontario, *Goods Movement in Central Ontario: Trends and Issues Technical Report*, December 2004.



Map 2 : Long-Distance Truck Trip Origins and Destinations in the GTHA.

Source: National Roadside Survey (2005), Commercial Vehicle Survey (1999, 2000, 2001)

2.4 Range of Modes

The movement of goods and services can be performed by different modes ranging from simple walking trips to large marine shipments. Often, the movement of a single commodity will involve several modes. While some modes tend to dominate the discussions around goods movement planning, all modes are important and will play a role in achieving the goals of the RTP.

Picture 2 : The trip home from the grocery store is often the last leg of a multi-modal trip for several items.

One of the interesting aspects about goods movement is that attitudes and preferences have less of an impact on goods movement than on passenger travel. Decisions on the mode to be used for shipments are business decisions driven by time and cost. This is why we see bicycle couriers used for delivering packages in downtown Toronto and why intermodal containers are off-loaded onto rail cars in Montreal as opposed to continuing up the St. Lawrence Seaway. Many of the vessels carrying containers are too large to pass through the St. Lawrence Seaway and the extra time to pass through the locks of the seaway outweigh the costs of trans-shipment.

The table on the following pages illustrates the many different types of modes that are used for moving goods and delivering services in the GTHA and their significance to the RTP.

Modes Used for Moving Goods and Delivering Services				
	Mode	**Typical Commodities**	**Typical Trip Length**	**Significance to RTP**
Local	**Walking and Bicycles**	Small parcels, groceries, retail purchases	Less than 2 kilometres (km) (walking). Less than 10 km (bicycling)	Human-powered goods movement replaces short car trips, reduces emissions and alleviates congestion
	Automobile	Small to large purchases	Less than 100 km	Short and frequent trips use up road capacity
	Service Vehicles	Personnel, tools, waste (garbage trucks)	Less than 15 km	Congestion impacts cost of delivering services
	Small Truck	Local deliveries to retail establishment, offices, institutions, homes, etc.	Generally less than 30 km	Congestion impacts cost of delivering services
	Public Transit	People carrying goods; most inter-city buses carry commercial parcels	Five to 200 km	Significant improvements are required to mitigate congestion on roadways; dedicated transit lanes may impact deliveries; public transit is not currently viewed as a mode of goods movement
Regional	**Large Truck**	Bulk and finished goods as well as time-sensitive goods	Less than 800 km	Congestion impacts cost of deliveries; truck facilities require large amounts of land; overweight trucks reduce life of road infrastructure

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Modes Used for Moving Goods and Delivering Services				
	Mode	**Typical Commodities**	**Typical Trip Length**	**Significance to RTP**
National	**Rail**	Heavier commodities, such as raw materials and minerals, travel longer distances	More than 500 km	Freight and passenger services share rail infrastructure, may restrict increases in passenger services; rail freight lines are approaching capacity
	Inter-Modal	Finished goods and higher-value commodities	More than 400 km	Creates concentrations of truck movements; land-use compatibility issues
	Air	Lighter, high-value, time-sensitive goods	Global	Creates concentrations of truck movements; land-use compatibility issues; high contribution to global emissions
	Marine	Heavier raw materials such as coal, iron ore and salt. Also steel and steel products	Generally less than 600 km for shipments to/from GTHA	Access to ports by truck and rail
	Pipeline	Natural gas, oil, petroleum products	Up to 4,000 km	Can substitute for road and rail movements

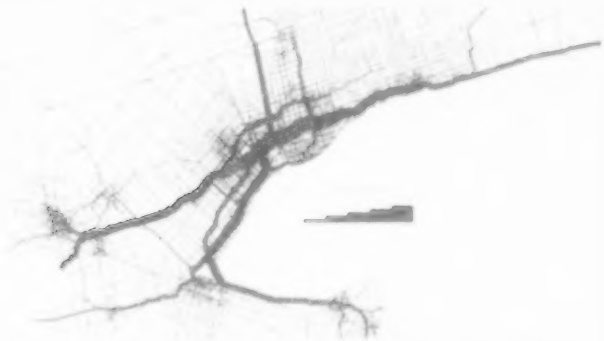
Table 2 : Modes Used for Moving Goods and Delivering Services

2.5 Trucking

In terms of both tonnage and value of inter-city goods movement to/from and within the GTHA, trucking is by far the most common mode. In 2006, trucks transported 68 per cent of Ontario's export value and 84 per cent of the province's import value.

There is a large distinction between the different types of truck movements that occur in the GTHA. Longer-distance movements are dominated by large tractor-trailers, whereas intra-urban goods movement is carried out by a range of small, medium and heavy trucks.

Because trucks share the roads with other vehicles, road congestion can have a significant impact on their efficiency. Similarly, trucks contribute to road congestion because of their size and operating characteristics. Map 3 shows the relative volumes of truck traffic on the road of the GTHA.



Map 3 : Total Truck Volumes on GTHA Roadways (Daily Trips)

Source: Greater Golden Horseshoe Model, BI Group

2.5.1 INTRA-URBAN TRUCK CHARACTERISTICS

Within urban areas, the level of truck travel tends to be consistent over the working day. When trucks travel during the commuter peaks, it is often in the mornings. These include, for example: couriers trying to meet 10 a.m. office delivery targets, trucks delivering goods to supermarkets, stores and restaurants, etc. Most urban trips are made by light trucks and vans, because of small shipment sizes, greater maneuverability in congested conditions, and fewer parking constraints. [2]

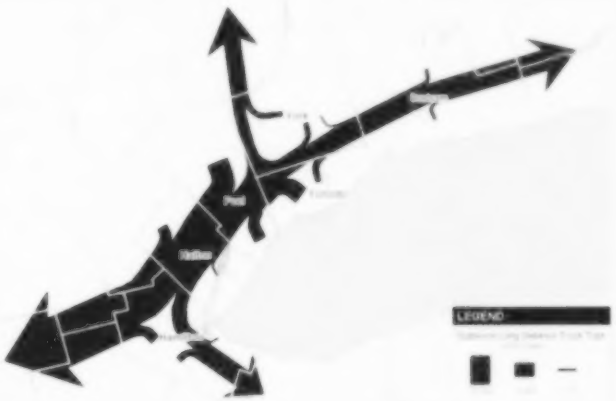
It is these "many-to-many" movements by smaller vehicles which tend to be the most inefficient. Truckloads are often less than one-quarter of a truck's capacity while close to one-third of all movements are empty. [3]

These urban truck movements to distribute goods to stores and make deliveries to homes and business establishments and other such locations represent some 11 per cent of vehicle trips in the region. Urban truck trips will likely grow with the economy and the region's population. They will contribute to, and be affected by, growing traffic congestion or the region's roads and highways.

2.5.2 LONG-DISTANCE TRUCK TRIP CHARACTERISTICS

It is estimated that more than one-half of all long-distance truck trips to/from the GTHA either start or end at a truck terminal, many of which also involve a warehouse facility. It is not surprising that the majority of truck trips captured by roadside surveys report origins and destinations in places such as Mississauga, Brampton and Hamilton, which have a high concentration of these types of facilities. It is noteworthy that only three per cent of trips over 200 km have a direct destination to a retail facility, implying an intermediate step involving a warehouse or transfer facility prior to the final delivery.

As shown on Map 4, the largest majority of truck movements into and out of the GTHA are to and from the west, to Southwestern Ontario and the United States.



Map 4 : Daily Long Distance Truck Movements – GTHA Outbound and Inbound.

Source: National Roadside Survey (2003), Commercial Truck Survey (1999, 2000, 2001), Statistics Canada

2 Ministry of Transportation of Ontario, *Goods Movement in Central Ontario, Trends and Issues*, Technical Report, December 2004.
3 Ibid

Longer distance truck trips, comprised largely of tractor trailer vehicles, currently represent one per cent of the vehicle trips in the region, but are largely concentrated around key facilities, like 400-series highways and major industrial areas. The flexibility of trucks compared to rail and marine makes it the dominant freight mode for trips of less than 500 km, carrying more than 80 per cent of the freight by weight. However, like urban truck movements, long-distance truck movements are affected by growing congestion, and major delays and disruption on the region's major roads and highway network.

2.6 Rail

The GTHA is primarily served by the two main rail freight systems in Canada: CN and Canadian Pacific Railway (CPR). Between most freight nodes, there are at least two options for freight connections and, in some cases, short lines and regional railways provide additional options. The location of major rail lines is presented in Map 5.

Map 5 : Major Rail Lines and Associated Facilities.

Source: Compiled from Ministry of Transportation of Ontario, *Goods Movement in Central Ontario: Trends and Issues, Technical Report*, December 2004.

The Orangeville-Brampton Railway, the Ontario Southland Railway, and the Goderich and Exeter Railway are short lines that serve the GTHA. The Ontario Southland Railway provides an important connection between the Port of Hamilton on Lake Ontario and the Port of Nanticoke on Lake Erie. There are a number of other short lines that provide feeder services to the main lines of CN and CPR throughout the region. Over time, with competition from trucks, short lines have lost some of their relative importance; some have even been dismantled.

Railways are responsible for moving about 14 per cent of the freight tonnage into and out of the GTHA. By comparison, approximately one-half of the total freight tonne-kilometres in Ontario, as a whole, are attributable to rail. As shown in Map 6, the highest volume of rail traffic coming into the GTHA is from the north and west, whereas the highest outbound flows are to the east.

Map 6 : Daily Long Distance Rail Movements – GTHA Outbound and Inbound.

Source: *Quebec-Windsor Corridor Study*, IBI Group, 2007

The rail mode is primarily used for long-distance bulk and intermodal movements. Adding the extra time and costs for pickup and delivery, usually by truck, means that rail movements are not viable for most shorter distances (less than 800 km). It is estimated that two-thirds to three-quarters of the truck traffic movements in the GTHA are captive markets, meaning that they either originate or are destined to a facility that is not served by rail, or they are such short movements that it does not make sense to transfer the goods onto and off of rail.

The major Canadian railways have been successful in attracting higher volumes of longer-distance goods to the point where capacity on many of the main lines is at a premium. For example, one of the reasons that CPR discontinued their Toronto to Detroit intermodal service was the lack of main line capacity; it was not economical to use up this capacity for a business that had relatively low margins.

2.7 Intermodal

Intermodal freight is defined as the movement of a single package which is carried by more than one mode of transportation. The most familiar example is the transfer of cargo in containers or trailers between rail, marine and road modes.

The major truck-rail intermodal terminals include CN Brampton Intermodal Terminal, CPR Vaughan Intermodal Terminal, CPR Obico Intermodal Terminal in Etobicoke, and the CPR Expressway Terminal in near Milton, Ontario. While data on the traffic handled at each of these facilities are confidential, it is estimated that Brampton, Vaughan and Obico terminals together attract approximately 6,000 truck trips per day.

There are also a number of other rail-highway intermodal terminals in the GTHA as illustrated in Map 7. For example, automobiles are transferred from rail cars to road vehicles in auto complexes in the GTHA. There are other specially equipped locations where steel coils, ingots or bars, or forest products are transferred between trucks and rail cars.

Map 7 : Major Intermodal Facilities in the GTHA.

Source: IBI Group 2006

Currently, there is very little intermodal container traffic handled by the ports in the GTHA. Modern container ships do not generally enter the Great Lakes as most are too large for the locks of the St. Lawrence Seaway.

2.8 Marine

There are four main ports in the GTHA: Hamilton, Toronto, Mississauga/Clarkson, and Oshawa. On a tonnage basis, these ports handle about 15 per cent of the inter-city goods moved to and from the GTHA. Although marine freight activity peaked in the late 1970s, long-term trends in this activity have shown a decline in the GTHA and elsewhere. However, marine freight activity at three of the GTHA's ports has remained relatively stable over the last two decades. Traffic through the Port of Hamilton has even increased by 14 per cent over the last decade.

Marine is primarily used for the movement of bulk goods, such as coal and iron ore for the production of steel and road salt. As a general rule, marine bulk traffic does not travel far inland from the port of handling and the majority of traffic is inbound. Selection of the marine mode depends on the quantity, service level and length of time over which traffic would be committed. Shorter time frames and smaller quantities favour the road and rail modes (with the proviso that equipment is available) and longer time frames with larger quantities are more suitable for the commitment of vessels to regular service patterns.

In the past, the marine mode on the Great Lakes also carried what may have been described as intermodal traffic. This was general freight which was transferred between marine, truck and rail at various points. This traffic died out because of the relative slowness of the marine mode. An organization called Highway H2O is now trying to reinvigorate "short sea shipping" on the Great Lakes. This could potentially remove traffic from the road and rail modes. However, there is also pressure on some ports, such as Toronto, to be redeveloped for other purposes which generate greater taxable assessments.

2.9 Air

Goods moved by air tend to be light, valuable and time-sensitive products that can absorb high shipping costs. These movements always require truck transportation at the beginning and end of the trip, so they are considered to be intermodal in nature. In 2004, the top products shipped by air were machinery, electrical equipment, aircraft and transportation equipment.

By far, the most important airport in terms of Canadian goods movement is Toronto Pearson International Airport. Pearson Airport is the largest air cargo hub in Canada with over 500,000 metric tonnes, representing 45 per cent of all the air cargo traffic in Canada. The vast majority (if not all) of Pearson freight traffic is carried in the holds of

passenger aircraft on scheduled flights. John C. Munro Hamilton International Airport is also significant in that it is the largest integrated courier cargo airport in Canada. One of the attractions of the Hamilton airport is that it allows 24-hour operation. Cargo traffic out of that airport dropped 13 per cent in 2004 when FedEx relocated its cargo hub to Pearson Airport, but has increased by 23 per cent from 2006. The Hamilton airport remains the Canadian hub for four courier companies, including the three largest – UPS, CargoJet and Purolator Courier Ltd. To date, its air cargo traffic has primarily been within the domestic market and is now moving into the larger international market.

2.10 Active Transportation

Although small in terms of the amount of goods moved, bicycles and walking are important methods of moving goods. For example, bike couriers and "on-foot" couriers are becoming more important in downtown areas where they provide much faster delivery times than vans or cars. In 2001, it was estimated that there were over 50 courier companies using active transportation modes for certain deliveries, including 350-400 bike messengers. [4]

Picture 3 : Active transportation plays a key role in moving many goods in dense, urban areas.

One of the most familiar examples of goods movement by active transportation is mail delivery by walking postal workers. Picking up a parcel or even shopping on foot also belongs in this category.

4 Greater Toronto Services Board, *Goods Movement Strategy*, 2001

3 Key Issues

As a large, diverse metropolitan area, the GTHA must develop a strategy for moving goods and delivering services that addresses quality of life and environmental sustainability objectives while ensuring continued economic growth. There are three lenses which have been adopted by Metrolinx in developing the RTP: People; The Environment; and The Economy.

3.1 Social Impacts

Freight transportation is essential to the functioning of our urban areas. Virtually all goods and services that are necessary to people are ultimately delivered by trucks to the home or to the store. Unfortunately there are also many negative social issues that are associated with moving goods and delivering services. From the public's perspective, goods movement is associated with large noisy trucks on highways and through residential areas, large land uses and safety concerns due to spills and collisions. [1]

Picture 4 : Current land use patterns can create undesirable traffic patterns for residential communities.

Ultimately, most of the social concerns related goods movement and services delivery arise from the fact that goods movement and communities overlap in urban areas. In well-established areas, people and goods movement activities must compete for both land and infrastructure.

Bearing in mind the objective of minimizing social impacts, a GTHA goods movement strategy should:

- Protect sensitive land uses (e.g. homes, schools, hospitals) from the undesirable impacts of freight activity, both through adequate separation and appropriate design;
- Provide infrastructure to serve goods movement that minimizes impacts on the safety, comfort and service offered by passenger transport modes such as walking, cycling, public transit and the automobile; and
- Respect the principle of developing complete communities.

3.2 Environmental Impacts

Freight transportation is a significant and growing consumer of energy and, therefore, a contributor to Greenhouse Gas (GHG) emissions. In 2005, freight transportation accounted for 43 per cent of all transport energy use in Canada. From 1990 to 2005, freight energy use grew more than 3½ times faster than passenger energy use. It is now almost 61 per cent higher than in 1990. [2]

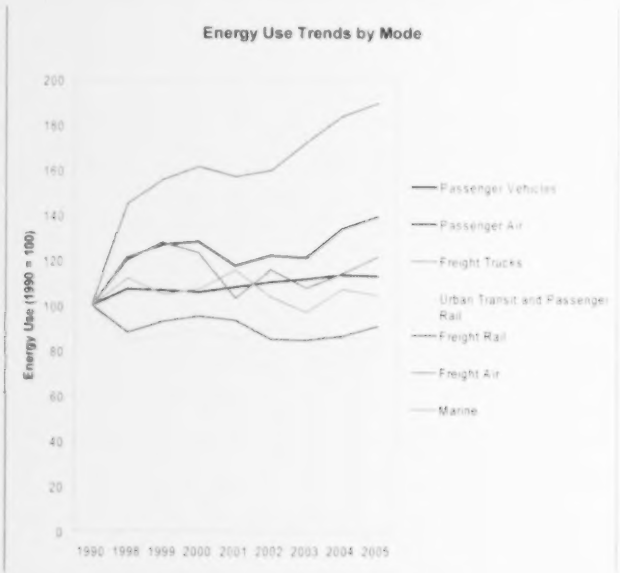


Figure 2 : Energy Use Trends by Mode.

1 Ontario Trucking Association, *Sharing the Road a Truck Brochure*, 2002

2 Natural Resources Canada, Office of Energy Efficiency. The new 2005 data are now available in *Comprehensive Energy Use Database, Energy Use Data Handbook Tables* and *Energy Efficiency Trends Analysis Tables*

The largest percentage of energy use from freight transportation is from trucks, accounting for about 81 per cent of total freight transportation energy use in Canada and likely a much higher proportion for freight transportation in the GTHA. Energy use by trucks has increased by about 90 per cent since 1990 [3] and truck traffic in the GTHA has been growing at a significantly greater rate than the region's population or employment.

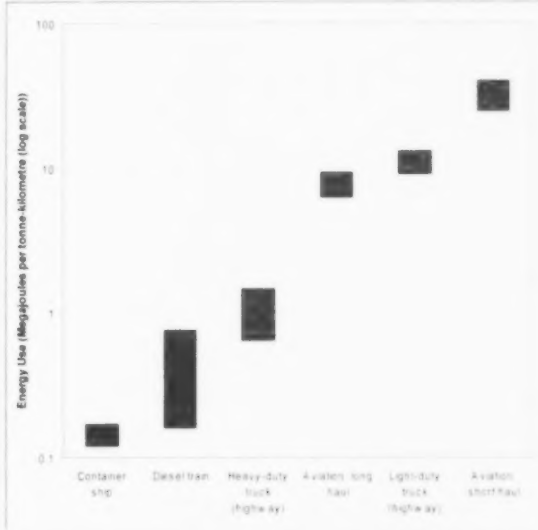


Figure 3 : Ranges of energy use per tonne-kilometre of fully loaded vehicles in Europe in the late 1990s.

Source: The Centre for Sustainable Transportation, *Sustainable Transportation Monitor*, April 2001

The goal of slowing or reversing current trends in the freight sector's energy consumption and GHG emissions is challenging. Demand management measures and technological improvements can improve efficiency, but this may be outweighed by continued economic growth, the demand of consumers for cheaper goods that can be replenished more quickly in stores, and private-sector practices to meet that demand. However, the importance of reducing energy use and emissions over the longer term cannot be overstated.

Climate change is emerging as a key global issue. Although energy use currently represents less than five per cent of the price of most goods, energy costs are expected to increase substantially in coming decades. Efforts that enable a gradual but determined restructuring in the industrial and transport sectors will ultimately contribute to a more sustainable community.

Bearing in mind the objective of minimizing environmental impacts, a GTHA goods movement strategy should also:

- Encourage and support a shift to more energy efficient freight modes;
- Encourage and support actions to increase the efficiency of technologies and practices within each freight mode;
- Encourage collaboration by freight stakeholders to pursue continuous improvements in environmental performance; and
- Encourage industry and business to more actively collaborate and share utilities and infrastructure in freight facilities.

3.3 Support Economic Competitiveness

The GTHA generates about 30 per cent of Canada's economic activity and more than 400 million tonnes of goods are transported to, from or through the region each year. In 2001, wholesale trade and transportation logistics industries alone accounted for some 287,000 jobs in central Ontario comprising 7.1 per cent of the region's employment. [4]

One of the major economic drivers of freight demand is manufacturing — the largest employment sector in the GTHA. But the nature of manufacturing is changing. A decline in some traditional industries is now being offset by growth in complex, higher-end manufacturing activity. Given the GTHA's very positive economic outlook, the region's need for an effective, efficient and adaptable goods movement system is expected to increase.

In addition, the GTHA has an important warehousing and service function delivering goods to its expanding population base. The region also has a significant break-in-bulk function to maximize logistical efficiencies in order to deliver goods to its hinterland/trade area.

3 Ibid
4 Ministry of Transportation, *Goods Movement in Central Ontario: Trends and Issues, Technical Report*, December 2004

In order to support economic competitiveness, a GTHA goods movement strategy should:

- Sustain the economic competitiveness of the GTHA by enabling the effective movement of goods and services to, from and within the region;
- Encourage and support the location of freight-intensive land uses in a manner that maximizes access to key transportation infrastructure and creates synergies among elements of the goods movement industry; and
- Maximize the efficiency of goods movement within the GTHA, as well as the flexibility to maintain that efficiency by adjusting to economic or technological changes over time.

4 Integrating Goods Movement and the Built Environment

4.1 Land Use

4.1.1 LOCATING GOODS MOVEMENT-INTENSIVE DEVELOPMENTS

While much of the industrial land use and associated transportation infrastructure in the GTHA is well-established and will not change rapidly, the relationship between land use and goods movement requires continued attention. This means avoiding residential development that encroaches on or is in close proximity to rail, marine and air terminals and the ensuing compatibility and expansion problems that inevitably occur. It also means locating new industry in areas that minimize the impacts between their goods movement needs and expectations of existing communities.

Logistics Centres

Logistics Centres are large-scale freight facilities akin to distribution centres. Often larger than one million square metres (the Staten Island Logistics Centre at the Port of New York takes up 4 000 000 square metres), they seek rail, road and marine access. These centres play an important role in the logistics industry and can be beneficial in reducing the number of trips entering urban areas. They can also have the following impacts:

- Space consumptive;
- Expensive to serve with public services and facilities;
- Potentially low fiscal and employment benefits;
- Barriers in the urban fabric and poor interfaces;
- Negative landscape and aesthetic impact, issues with stormwater management; and
- Noise, light and traffic nuisances.

The *Growth Plan* provides guidance on the issue of locating employment uses in locations supportive of goods movements. It states that, "Municipalities will plan for land uses in settlement areas adjacent to, or in the vicinity of, transportation facilities such as intermodal facilities, rail yards, airports, dockyards and major highway interchanges, that are compatible with, and supportive of, the primary goods movement function of these facilities."

The *Growth Plan* identified three future transportation corridors. The Greater Toronto Area (GTA) West Corridor is a relatively new concept and represents a strategic link between the urban growth centres to the west such as Downtown Milton, Downtown Brampton, Vaughan Corporate Centre, Downtown Guelph, Downtown Kitchener, Uptown Waterloo, and to Highway 401. The Niagara to GTA Corridor has been studied more extensively and would connect the western part of the GTA and Hamilton with the Niagara region and the U.S. border. The extension of Highway 407 to the east would link the existing Highway 407 to both the Peterborough region and, by controlled access highway, to Highway 401. Environmental assessments are underway for these corridors and are in various stages of completion.

It can be expected that, as the development of urban areas intensifies, conflicts between land uses will grow unless planned appropriately. However, the solution cannot simply be to keep moving industry farther from the urban area, since this has broader transportation implications in terms of commuting patterns and servicing these industrial areas by transit. Transportation infrastructure must be used to help shape urban development patterns in a way that minimizes land use conflicts, improves community liveability, maximizes goods movement efficiency and minimizes the impact on the environment — a task that is easier said than done.

Map 8 : Growth Plan Schedule 6 – Moving Goods.

Source: Growth Plan for the Greater Golden Horseshoe, Ministry of Public Infrastructure Renewal, 2006

Freight and Logistics Clusters

Clustering together of freight and goods-intensive land uses can improve opportunities for more efficient goods movement. A "freight and logistics cluster" is an area in which activities related to freight transport, logistics and goods distribution are coordinated. This includes shippers, warehouses, storage areas, public agencies and planners, businesses, etc. Ideally these clusters should be served by multiple modes (i.e. road, rail, waterways, air transport) in order to maximize the efficiency of transfers. The basic idea is that the collection of companies and manufacturers focused with similar distribution patterns in a single location allows for the sharing of resources, freight consolidation and flexibility. This type of clustering requires regional coordination and leadership.

CASE STUDY: City of Hamilton

The City of Hamilton identified logistics as an emerging industry cluster in its economic development strategy. In response, one initiative centred on the freight role of the Hamilton airport. The Airport Employment Area concept embraces the notion of a master-planned community of industrial and commercial businesses and retailers surrounding the airport, taking advantage of the fact that the airport is a 24-hour operation. It seeks to avoid intrusion by residential uses into the airport noise contour. Another initiative focuses on the notion of adding value to the major goods flows through the city, which are made up largely of through-traffic. The initiative focuses on lands at the east end of the Port of Hamilton that offer good access to the Queen Elizabeth Way and rail lines, and that are undergoing transformation away from heavy industry. As large employers like Procter & Gamble, U.S. Steel Canada, and Dofasco change in response to their markets, the character of smaller related businesses is also subject to change.

Table 3 : CASE STUDY: City of Hamilton

4.1.2 PROTECTING QUALITY OF LIFE

Compatibility issues regularly arise between freight transportation facilities and residential uses. As discussed above, some jurisdictions have designated what is referred to as a "Strategic Goods Movement Network" which outlines where freight-intensive uses are or ought to be located. Land-use can then be tied into the network definition through zoning and other policies for buffer zones adjacent to transportation corridors and incentives for transportation and warehousing to locate in such zones.

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Since 2004, the Ministry of Transportation for Ontario (MTO) has been examining ways to address issues related to gridlock, quality of life, and the economic competitiveness of individual communities and the Ontario economy, recognizing:

- the influence of land use on transportation patterns;
- the inability of transportation infrastructure and facilities to keep pace with development;
- the changes in methods of production and distribution; and
- the key supportive role of efficient goods movement to the overall economy.

This work has included a comprehensive review of existing official plans and zoning by-laws and addresses the often competing objectives of public transit and freight transport operations in the same corridors.

CASE STUDY: FCM/RAC Community-Rail Proximity Initiative

In May 2003, the Federation of Canadian Municipalities (FCM) and the Railway Association of Canada (RAC) signed a (three-year) memorandum of understanding (MOU) to build common approaches to the prevention and resolution of issues that arise when people live and work in close proximity to railway operations. In January 2007, the FCM and the RAC signed a new (two-year) MOU to continue to build upon the successes achieved between 2003 and 2006.

To enable better communication and understanding, the FCM and RAC have developed a Community-Rail Proximity Initiative and Steering Committee. Under the MOU, the committee will develop and implement a strategy to reduce misunderstanding and avoid unnecessary conflict arising from railway-community proximity. Areas for action include: developing commonly understood proximity guidelines; improving awareness among all stakeholders regarding the need for effective planning and management; and developing a dispute resolution protocol to guide concerned parties when issues emerge.

The Canadian Association of Municipal Administrators (CAMA) has also joined the committee and may provide ongoing professional advice. Others may become party to the MOU with the consent of the RAC and FCM.

Table 4 : CASE STUDY: FCM/RAC Community-Rail Proximity Initiative

CASE STUDY: Freight Grants

In Great Britain, the Ministry for Transport provides grants to private industry to enable them to switch from road to rail haulage of either incoming or outgoing products. The grants pay only a partial amount of the capital costs of these improvements but can be the tipping point for many industries. The grants are used to construct sidings, loading facilities or other parts of rail infrastructure that permit new services to be introduced. The firm receiving the grants has to undertake to use rail haulage for a certain period of time. This program has been moderately successful in transferring goods from road to rail.

Table 5 : CASE STUDY: Freight Grants

4.2 Transportation Infrastructure

As described, goods movement requires an effective transportation system. Defining a strategic goods movement network is often considered an essential first step. Such a network identifies the key existing and planned facilities and corridors used for goods movement, along with any gaps, so that land uses can be planned accordingly around this network to ensure compatibility.

The definition of a strategic goods movement network can include the protection of major railway lines, as well as the development of new goods movement corridors. Railway grade separations, improved roadway access to freight terminals and roadway geometric improvements are further examples of freight infrastructure actions.

Without question, most options related to improving goods movement involve an extensive commitment of financial resources. Therefore, major infrastructure improvements must be assessed in terms of their net benefit. For example, is it preferable to construct a new highway for trucks or instead invest in improving transit facilities so that existing routes are less congested? Very few of the infrastructure initiatives in other jurisdictions appear to have made such a cost-benefit analysis. Most often the focus has been on project-specific economic benefits. One task of the RTP will be to coordinate recommendations on freight transportation infrastructure with transit infrastructure and vice versa.

CASE STUDY: Truck-Only Lanes

The concept of truck-only lanes has been talked about for many decades, but very few examples exist in North America. In recent years, however, many jurisdictions in the United States have initiated feasibility studies for truck lanes, including Georgia, Ohio, Nevada and California.

Essentially, **Truck-Only Lanes** is a transportation design concept that separates heavy trucks from the general traffic stream of passenger vehicles and light trucks. The concept can be extended to include **Truck-Only Toll (TOT)** lanes whereby commercial vehicles can choose to pay a fee to use the lanes.

In February 2001, the Southern California Association of Governments (SCAG) completed a feasibility study report (FSR) on exclusive lanes for commercial trucks. The report included a literature review which revealed that exclusive truck lanes were the most plausible for congested highways where three factors exist: (1) truck volumes exceed 30 per cent of the vehicle mix; (2) peak hour volumes exceed 1,800 vehicles per lane-hour; and (3) off-peak volumes exceed 1,200 vehicles per lane-hour. In sections, Highway 401 would meet these warrants.

One of the issues that tends to arise in the discussions of truck-only lanes is whether it is preferable to create designated lanes for trucks or to invest in designated lanes for transit or rapid transit to alleviate highway congestion.

Table 6 : CASE STUDY: Truck-Only Lanes

Ownership of Rail Lines

In the GTHA, passenger and freight trains generally share the same infrastructure, in some cases, single railway track lines. In many instances, this sharing of infrastructure causes problems because of the interaction of the two types of trains. Passenger trains frequently wait for freight trains and cannot use their full-speed potential. As a result, the full potential of inter-city passenger services is not achieved.

Rationalizing the use of the railway networks of southern Ontario between freight and passenger services so that freight services can be concentrated on certain lines and passenger services on others is one possible solution. The implementation of the original GO Transit commuter rail facility was only made possible by the construction of the CN bypass line which took freight trains off of the Lakeshore route. Such a rationalization could potentially improve the fluidity of the system and improve service for both passenger and freight.

To date, these initiatives have not been studied in detail. Metrolinx and other GTHA agencies could cooperate with the provincial and federal levels of government to implement such a rationalization. A major problem is the ownership of the rail infrastructure by private companies. The rationalization of rail movements would require complex tradeoffs between control and ownership, although there are many examples of CN and CPR sharing the same tracks.

CASE STUDY: CREATE Chicago

The Chicago Region Environmental and Transportation Efficiency (CREATE) is a multi-year investment program that was launched in 2005. It adopts a "total system approach" involving freight rail, passenger rail and highway capacity improvements. The main participants are the U.S. Federal Highway Administration, the Illinois Department of Transportation and the Chicago Department of Transportation, working with industry and the public. The Association of American Railroads is a participant in the program, acting on behalf of the six Class 1 Railroads operating in the Chicago area, including both CN and CPR.

CREATE includes the development of five rail transportation corridors. Four of the corridors are primarily for handling freight traffic in the Chicago metropolitan area. A Passenger Express Corridor is primarily for handling commuter and interstate passenger traffic. Projects include: upgrading of existing track structure; the double-tracking or triple-tracking of certain lines; the construction of grade separations and flyovers; the installation of new or improved signalling; and various other additions and improvements totalling approximately 70 discrete projects. Certain improvements (e.g. grade separation projects) on existing rail lines outside the corridors are also incorporated.

Table 7 : CASE STUDY: CREATE Chicago

4.3 Alternative Futures and Potential Initiatives

When analyzing the future environment for goods movement in the GTHA, three possible scenarios have been defined. These include: a Trend Scenario, which is a continuation of what we are doing now with some improvements, an Incremental Scenario, which will involve substantial changes, and a Bold Scenario whereby major initiatives have been undertaken. A description of these scenarios as it relates to goods movement is given on the following page. Also included are specific initiatives that might be introduced to improve the coordination of land-use planning for goods movement.

If the current situation continues unchanged, freight activities will remain focused on existing terminals and corridors, and it will be a challenge to keep residential development from encroaching on these locations. New manufacturing facilities will likely be sited on the basis of available land, access to employment and proximity to highway corridors, and may not necessarily take into account synergies from clustering activities. With little regional coordination, the location and design of large and/or important facilities will remain in silos.

With the introduction of some interventions, the development and implementation of guidelines for freight supportive land-use can focus on: enhanced land-use and value; reduced noise and vibrations; improved traffic flow and lowered congestion; and improved safety and security. The development of an inventory and future needs assessment of industrial lands and freight corridors throughout the GTHA can provide a basis for planning for goods movement. The advancement to a region where goods-intensive manufacturing, warehousing and distribution activities are recognized as a separate category of land-use, respecting the needs of these industries as equal as the need for residential and other sensitive land-uses to be shielded from them.

Further interventions can help to create a strategic goods movement multi-modal network with specific attributes and measures to protect the functional characteristics of the infrastructure and lands. Safety audits on all truck routes and geometric and signage changes could be implemented as a result. The creation of new intermodal facilities would take advantage of increased use of marine, rail and air for freight movement, while investments in transit have the potential to mitigate congestion. The establishment of new economic corridors and nodes/gateways, designed to expedite goods movement by truck, air, and rail, will further improve efficiencies in the system. This could include such measures as separate tracks for freight and passenger trains on rail corridors or new intermodal terminals created though Private-Public partnerships to ensure seamless integration between modes. Appendix A displays sample interventions that could help to achieve these developments.

OPTIONS FOR ACTION: MOVING GOODS AND DELIVERING SERVICES		
Land Use		
Trend Scenario	**Incremental Scenario**	**Bold Scenario**
Freight activities are focused on existing terminals and corridors and it is a challenge to keep residential development from encroaching on these locations. New manufacturing facilities are sited on the basis of available land, access to employment and proximity to highway corridors, and do not necessarily take into account synergies from clustering activities. There is little regional coordination on the siting and design of large and/or important facilities.	Freight supportive land-use guidelines focusing on land use and value, noise and vibrations, traffic flow and congestion, safety and security have been developed and implemented. An inventory and future needs assessment of industrial lands and freight corridors throughout the GTHA has been developed as a basis for planning for goods movement.	Goods intensive manufacturing, warehousing and distribution activities are recognized as a separate category of land use. The needs of these industries are respected as is the need for residential and other sensitive land uses to be shielded from them. A regional strategy on the siting and design of large and/or important facilities has been developed.

Table 8 : Land Use

OPTIONS FOR ACTION: MOVING GOODS AND DELIVERING SERVICES		
Infrastructure		
Trend Scenario	**Incremental Scenario**	**Bold Scenario**
Targeted investments in road infrastructure such as new interchanges near freight centres and upgraded highway ramps have helped to mitigate the effects of congestion on goods movement. A regional truck route network has been defined using consistent policies. A strategic goods movement multimodal network is defined with specific attributes and measures to protect the functional characteristics of the infrastructure and lands.	Safety audits have been conducted on all truck routes and geometric and signage changes have been implemented as a result. New intermodal facilities have been created to take advantage of the increased use of marine and rail for freight movement. Investments in transit have helped to mitigate congestion.	New economic corridors have been established and are designed to expedite goods movement by truck and rail, and land use controls are in place to ensure that these new corridors do not promote sprawl. Major freight corridors have been designated; their functioning is protected by land use controls and anticipation of future infrastructure needs. Most rail corridors have separate tracks for freight and passenger trains and rail efficiency takes precedence over trackage ownership. Several new intermodal terminals have been created through Private-Public partnerships to ensure seamless integration between rail, truck and marine modes.

Table 9 : Infrastructure

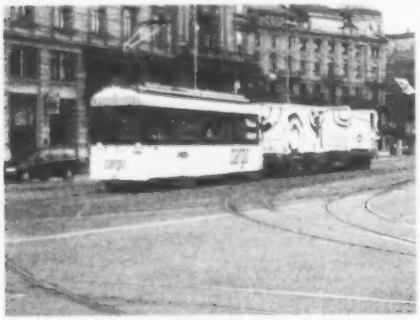
5 Enhancing Operational Practices

5.1 Innovative Urban Distribution

In the field of urban logistics, new ideas are moving from academia to practical application. One such concept involves Urban Distribution Centres (UDCs) or Urban Consolidation Centres (UCCs) — freight consolidation facilities located in very close proximity to final destinations. The purpose of these UDCs is to minimize the number of local pick-up and delivery trips by competing companies. One application in Bordeaux, France, situates the transfer point in the urban core with trolleys, carts, electric vehicles or bicycles carrying the figurative "first or last mile" of shipments, depending on their size. Benefits include a reduction in truck traffic and more efficient use of available road space, but it may be a challenge to find affordable sites in the right locations (since terminal sites on the edge of city centres may be scarce). Successful examples involve private services offered in a competitive market, with optional public participation usually taking the form of seed capital.

CASE STUDY: Amsterdam, The Netherlands

Downtown Amsterdam's historic winding streets can be a nightmare for commercial delivery truck drivers. Existing rules leave trucks a limited time window to access the city centre, and this restriction, although necessary to combat congestion, leads to rushed deliveries and some risky driving patterns.



Picture 5 : In Amsterdam, goods are delivered to their final address using electric vehicles.

In response to these constraints, Amsterdam launched the City Cargo pilot project in March 2007. Based on a successful program in Dresden, Germany, freight destined for downtown Amsterdam is first delivered to transfer depots at the edge of the city. Subsequent transport into the city centre consists of two stages. In the first stage, City Cargo Amsterdam takes the goods by tram to transfer hubs at strategic points in the inner city. From the hubs, which are situated on sidings off the passenger line, goods are transferred to small electric vehicles and delivered to the final address.

The project minimizes disruptions to passenger traffic on the tram system by ensuring cargo trams only travel where, and when, there is spare capacity. The transfer hubs are also situated on sidings where the passenger trams do not travel. The expected benefits of City Cargo include: improved liveability in the centre city; improved traffic flow; fewer collisions involving trucks; and lower road maintenance costs due to reduced heavy truck volumes. The project is also expected to create more than 1,200 jobs and replace 2,500 trucks. Based on a successful pilot run, Amsterdam is set to implement the full project in 2008.

Table 10 : CASE STUDY: Amsterdam, The Netherlands

CASE STUDY: Locking Up the Last Mile - Packstations

The challenge in last-mile deliveries is coordinating shipments with customer availability. Larger items are usually delivered on a pre-arranged schedule, but smaller items can often arrive when the customer is not available. One solution that exists in several western European countries are "Packstations" or "Locker Boxes". Operating like temporary postal boxes, customers choose their preferred drop-off point when placing an order. As soon as the company has the package in the box, a notification message is sent to the customer by e-mail or text messages. To retrieve the package, the customer enters a series of identification codes and passwords. The pick-up stations are usually located in corner stores, car parks, building lobbies and other locations with public access. Vehicle travel is minimized because people can walk to the boxes or combine their pick-up with other trips. The system has possibilities beyond consumer products and can be used in professional networks to support courier deliveries, travelling sales staff and field engineers.

Picture 6 : Shipment pick-up stations alleviate the challenges with coordinating shipments with customer availability.

Table 11 : CASE STUDY: Locking Up the Last Mile - Packstations

CASE STUDY: Nashville, Tennessee

In 2003, the Nashville Area Metropolitan Planning Organization (NAMPO) inaugurated a goods movement study that included a sketch-level cluster analysis for key industries in the region and their trading partners. One result of the study was a private-sector logistics consolidation centre with off-peak operations. Healthcare supplies are collected and stored at a central distribution centre in Atlanta, Georgia, from which multiple hospitals in the southeast are served. Supplies are delivered overnight to a regional distribution centre near Nashville, from which the hospital receives goods, mainly at night, with four-to-six hour service. Expedited one-to-two hour service complements the regular schedule and assures a ready supply of critical goods. The two-stage system allows consolidation of freight so that a small number of trucks arrive at the facility loaded with goods and replaces a system where many trucks arrived with small shipments. The system has improved the supply of goods in a time-critical environment, freed up storage space for healthcare use, cut healthcare costs and reduced demand on the transportation network.

Table 12 : CASE STUDY: Nashville, Tennessee

CASE STUDY: Heathrow Airport Retail Consolidation Centre
A consolidation centre was opened by the BAA (British Airport Authority) at Heathrow Airport in 2001 as part of their environmental strategy to improve air quality and packaging waste management. This 23,000 square metre consolidation centre, run on BAA's behalf by Exel, aims to reduce goods vehicle movements and to improve goods handling systems and waste packaging management in the terminals. In this scheme, goods destined for retailers with premises in the terminals are delivered to the consolidation centre (which is located away from the terminal buildings) rather than directly to the shops. Vehicles are operated by Exel to transport goods from the consolidation centre to the shops in the terminal buildings as the retailers require them. Deliveries to the consolidation centre are faster than to the shops as there is less congestion on approach roads and fewer delays in off-loading goods. Results show that in 2004, the centre received 20,000 vehicle deliveries. This resulted in 45,000 store deliveries being made from the centre on 5,000 vehicle trips. Of 240 retail outlets, 190 are using the centre. A vehicle trip reduction of approximately 70 per cent is being achieved for those goods that flow through the centre. This was estimated to result in 87,000 vehicle-kilometres saved in 2003 and 144,000 vehicle-kilometres saved in 2004. Vehicle emissions reductions have also increased as goods throughput has grown, with Carbon Dioxide savings of 1,200 kg per week in 2003 and 3,100 kg per week in 2004.

Table 13 : CASE STUDY: Heathrow Airport Retail Consolidation Centre

CASE STUDY: Stockholm, Sweden
The large-scale urban revitalization project of Hammarby Sjöstad in Stockholm centralizes all deliveries to the project site to a single logistics centre. This helps reduce the number of individual truck deliveries to the project site. This facility is located at the entrance to the project site. Small deliveries are unloaded at the centre and delivered by a single lorry to 22 different unloading zones within the working area, effectively replacing five vehicles with one. Larger cargoes are unloaded and stored at the centre before being delivered 'just-in-time' ensuring that only full trucks enter the area. A web-based delivery calendar allows drivers to schedule deliveries which facilitates unloading and minimizes queues at the project site. The on-site delivery vehicles conform to high environmental standards in order to minimize impacts of emissions and noise in the area.

Table 14 : CASE STUDY: Stockholm, Sweden

5.2 Optimization Through Technology

Competition in the goods movement industry drives the adoption of technology that improves productivity by individual operators. For example, the use of Global Positioning Systems (GPS), which are now becoming common in passenger vehicles, have been in use for commercial purposes for well over a decade.

Picture 7 : Real-time information can assist with route planning on the road.

Most examples of the use of technology relate to generating and communicating real-time information to freight transport companies and drivers/operators. Methods include: the provision of maps to indicate routes; load restrictions; time allowances; and physical characteristics of loading and unloading areas. Names and contacts for various purposes also comprise useful timely information.

Technology has also been used extensively to optimize loads for shipping, but largely on an independent shipper/carrier basis. There is significant potential for technology to enable even greater opportunities for load consolidation if information on shipments could be shared anonymously.

Many trucking companies now use GPS to keep track of their vehicles; however, this information is usually kept within the company and used for operational purposes. Real-time information on truck movement could be useful to the broader industry permitting decisions to be made on routes, pick-up and delivery scheduling and other activities. Transport Canada has conducted a pilot project to use this information to examine travel times on parts of the road system. This is a large potential source of data which has not yet been exhibited.

Simulation software has also been developed to assist companies with locating their facilities optimally to reduce the cost of serving their existing and potential customer base. Routing software is routinely used by large shippers and logistics companies to optimize deliveries, matching the right vehicles, merchandise, time, route, and sequence.

In addition to improvements in information technology, there are also innovations being made in vehicle and infrastructure design. Today, trucks are more fuel efficient than in the past and can be expected to continue to improve. The Canadian railway industry has made major strides in reducing fuel use while increasing tonnage by introducing new fuel-efficient locomotives and improvements in train operations.

CASE STUDY: Rail and Natural Gas Vehicles
Monoprix, a popular general merchandise store in France, is using a combination of rail and natural gas delivery trucks to reduce the environmental impact of deliveries to their stores. Using the existing infrastructure of the RER (Réseau Express Régional/Regional Express Network) merchandise is delivered to a 3,700 square metre warehouse located in a Paris suburb. From that point, a fleet of 20 natural gas vehicles (NGVs) takes the goods to 60 shops in inner Paris. The project represents 210,000 pallets or about 120,000 tonnes of merchandise. The rail/NGV combination will reduce Carbon Dioxide emissions by 280 tonnes and Nitrogen Oxide emissions by 19 tonnes per year. In addition, it will also save 8,000 truck trips per year. The Monoprix NGV fleets will be the first private French NGV distribution fleet.

Table 15 : CASE STUDY: Rail and Natural Gas Vehicles

5.3 Regulation

The regulatory environment concerning goods movement is complex and incorporates elements from all three levels of government. Coordination is not a simple matter of freight moves between modes and legislative jurisdictions.

The federal government's role in the transportation of goods involves the regulation of airports, railways, ports and international border crossings where it has overall jurisdiction. The regulations are mostly focused on safety. The federal government also regulates fuel options and harmful emission standards for vehicles. Recently, significant changes were introduced to diesel fuel standards. While these have reduced emissions, some

trucks are now burning more fuel. The industry is working to address these issues through improved engine and truck-body design.

Provincial regulations, while still concerned with safety, tend to focus more on road operations. At this level, there are weight, size and speed restrictions which can vary by time of day or season, log book and vehicle inspection stations, and licensing. Goods movement challenges can arise from these regulations when the gross vehicle weight of the truck permitted varies from one province to another and with neighbouring states. While there have been considerable efforts and progress to harmonize weights and dimensions across Canada and with states in the U.S., this can still be a major problem for long-distance truckers.

The municipal regulatory environment focuses on impacts that relate to the specific movement of transportation vehicles within local boundaries. This can include noise limits from train whistles and airplanes to the use of engine retarder brakes by truckers. Similar to the provincial regulations, seasonal and daily travel restrictions are also enforced at the local level, as are travel routes, parking and loading zones. Truck routes which are meant to keep commercial traffic on certain roads, may accomplish traffic calming in one neighbourhood, but may increase overall emissions by creating longer, less efficient routes.

In addition to legislation specifically targeting the transportation industry, all three levels of government are also involved, to some degree, in land-use regulations. The federal and provincial governments both deal with environmental and waterways legislation, while the municipalities address the relationship between various land uses. The location of industrial, commercial and residential projects can have significant impacts on goods movement. Warehouses and distribution centres located outside the city can find themselves at the centre of conflicting land uses as the fringe develops. Conflicts can also arise when municipalities find their long-term land-use visions butting up against each other.

From a goods movement perspective, there are significant opportunities for the coordination and harmonization of municipal regulatory environments. This can include truck routes and speeds, as well as land-use plans.

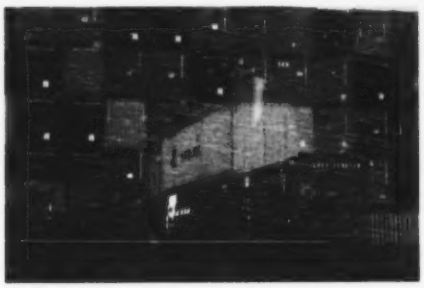
5.4 Pricing

The rules that determine goods movement choices are heavily weighted to short-term commercial justification criteria based on revenue/cost comparisons that exclude externalities (i.e. costs imposed on society in present and future generations) as well as the capital cost of facilities provided for "free" by the public sector. This behaviour is rational and logical. Goods movement-dependent firms locate themselves where they are able to minimize their capital and labour costs. Unfortunately, the costs, as seen by those decision-makers, do not incorporate all of the social costs that are involved, such as congestion impacts, noise and other nuisance impacts and GHG emissions. In general, environmental costs such as the consumption of new land for facilities and roadways and emissions generated are not intrinsic to goods movement decisions.

There is a need to get the price signals right. This could be as basic as finding ways to let consumers know the full transportation costs of their purchasing choices or it could be as complex as making users pay for the use of the transportation system, including externalities such as emissions, noise and congestion.

CASE STUDY: PierPASS - Los Angeles and Long Beach

PierPASS is a port-related agency operating in the Ports of Los Angeles and Long Beach. A joint effort of the marine terminal operators, PierPASS was established to address the push for a government-chartered effort to reduce port-related truck traffic during the day. The agency operates two programs — OffPeak and TruckTag — and all fees associated with the two programs are collected by the marine terminals to guarantee that the funds are used for the purposes for which they are collected.



Picture 8 : Charges are used to reduce port-related truck traffic in the Ports of Los Angeles and Long Beach.

The OffPeak program levies a fee on containers that use the land-side gates of Los Angeles and Long Beach's marine terminals. This fee is refunded or waived if the container travels by truck outside of peak hours or if it travels by rail. It is estimated that the OffPeak program has diverted more than five million truck trips from peak daytime traffic since the program's start in July 2005. In an average week, OffPeak removes 60,000 truck trips from the freeways during busy commuting hours, reducing congestion and benefiting local air quality.

While port-related trucking is not a significant issue in the GTHA, the overall concept of using charges to influence the use of road space by trucks is an interesting topic of discussion.

Table 16 : CASE STUDY: PierPASS - Los Angeles and Long Beach

5.5 Alternative Futures and Potential Initiatives

For the same three scenarios as identified in the previous chapter, the possible environment and initiatives for goods movement are described.

Continuing to follow the status quo will likely result in goods pick-up and delivery continuing to be done by a large number of independent firms and the efficiency of the system will continue to be limited by shippers, receivers and the competition. Private sector initiatives will continue to drive innovative investments. While some pooling among operators takes place, where market growth and competitive advantage justify the returns. Industry consultations to facilitate goods movement planning and sharing of data is not frequent.

The use of interventions, samples of which are exhibited in Appendix A, can create a different environment for operations and use of technology in goods movement and service delivery. For example, the application of regulations to limit deliveries and reduce goods movement in congested areas during peak hours in congested areas, off-set by improved flow during off-peak periods. Advances in technology could be used to further assist in information collection and dissemination, such as applying information on truck speeds to truck routing, as well as for the routing of other types of vehicles. Improved control systems on railways could allow a major increase in capacity for both freight and passenger services.

OPTIONS FOR ACTION: MOVING GOODS AND DELIVERING SERVICES		
Operations		
Trend Scenario	**Incremental Scenario**	**Bold Scenario**
Goods pickup and delivery continues to be done by a large number of independent firms. Efficiency is limited by shippers and receivers as well as the competition. Private sector initiatives drive innovative investments. Some pooling among operators takes place, where market growth and competitive advantage justify the returns.	Regulations are imposed to limit deliveries during peak hours in congested areas, but these regulations are off-set by improved flow during off-peak periods.	Goods movement in congested areas during certain times of the day is discouraged.

Table 17 : Operations

OPTIONS FOR ACTION: MOVING GOODS AND DELIVERING SERVICES		
Use of Technology		
Trend Scenario	**Incremental Scenario**	**Bold Scenario**
Industry consultations to facilitate goods movement planning and sharing of data are encouraged. Existing forums such as the Southern Ontario Gateway Council are strengthened. Traffic flow and congestion, safety and security, economic development and environmental sustainability are addressed in this initiative. Real time information on traffic conditions and routing options is used where possible by vehicle operators to minimize cost and fuel emissions. Vehicle efficiency and noise characteristics continue to improve.	The need for better information on goods movement is recognized.	Advances in technology are further used to assist in information collection and dissemination. Information on truck speeds will be used not only for truck routing but for the routing of other types of vehicles. Improved control systems on railways allow a major increase in capacity for both freight and passenger services.

Table 18 : Use of Technology

6 Planning and Coordinating Goods Movement

6.1 Government Leadership

Until recently, there have been few strategic efforts by government to plan for goods movement in the GTHA. Most Municipal Official Plans and Transportation Master Plans recognize goods movement but do not analyze their requirements in detail, a legacy of the perspective that goods movement is largely an issue of concern to the private sector. Some initiatives that have addressed goods movement in the GTHA are described in the following paragraphs.

Municipal goods movement studies. Within the last few years, both Peel Region and the City of Hamilton have undertaken major goods movement studies. Peel Region's study identified the need to collaborate with the private sector to improve data collection. It also identified several key infrastructure improvements to help ease pressures caused by the high density of industrial and warehousing land uses in Peel Region. Hamilton's goods movement strategy is centered on several key objectives, one of which centres on the notion of adding value to the major flows through the city. A vast majority of the freight traffic using Hamilton roads and highways is through-traffic, the origin and destination of which do not involve facilities located in Hamilton. The initiative is focused on lands at the east end of the Port of Hamilton with good access to the Queen Elizabeth Way (QEW) and rail lines. The strategy also recognizes the potential of Hamilton's airport and incorporates the concept of a master-planned community of industrial and commercial businesses, and retailers surrounding the airport.

Municipal Transportation Plans. The City of Hamilton Transportation Master Plan (TMP), York Region TMP, Durham Region TMP, and Peel Region Long-Range Transportation Plan (LRTP) all include meaningful recommendations on goods movement.

Ontario Ministry of Transportation and Transport Canada – Commercial Vehicles Surveys. The Ontario and federal governments have cooperated in periodic surveys of inter-urban truck movements which capture most truck trips of over 50 km in length. These surveys have been done from coast to coast and we now have reliable information on trends and patterns in-long distance truck movements.

Greater Toronto Services Board – Goods Movement Strategy. Completed in 2001, this study by the former Greater Toronto Services Board involved extensive stakeholder input and set the course for many of the initiatives related to industry consultations and data collection efforts that are now taking place. These included establishing a freight forum and developing a goods movement model for the GTHA.

Ontario Ministry of Transportation – Goods Movement in Central Ontario: Trends and Issues. This study, completed in 2004, provided information and set a foundation for the development of a goods movement strategy to support freight activities in the central Ontario region. The report provides a basis for planning and policy development for the Ministry, the regional municipalities and local governments in the central Ontario area. It also provides useful information for shippers, carriers and receivers. The study was seen as an important precursor to the development of a more comprehensive strategic transportation plan. It includes extensive data on all goods movement modes and facilities.

Transport Canada – Quebec-Windsor Corridor Freight Model. This ground-breaking study developed and calibrated an econometric freight mode choice model for the Quebec-Windsor Corridor. A consistent database of commercial vehicle, rail, intermodal rail and marine origin-destination flows was developed from multiple source to provide a comprehensive picture of existing goods movements. The factors that shippers and receivers take into account when making mode choices were identified and analyzed.

Despite this body of work, however, there is still a deficit in terms of our knowledge of goods movement and service delivery, particularly those operating within the urban areas. We really do not know the timing, length, origin or orientation of trips.

The operating companies know where their own vehicles are moving. Many use GPS systems to constantly monitor the position of their vehicles. For the future, this may offer the potential for a more comprehensive use of information through various mechanisms of pooling and sharing.

6.2 Stakeholder Collaboration

The goods movement industry is sensitive to the cost of congestion and other inefficiencies on the publicly supplied infrastructure. If improvements are not made to the public infrastructure, eventually, businesses will seek to locate to other jurisdictions, manufacturing firms will suffer from production delays, and customers will pay the cost of higher-priced goods.

While is it not up to governments to solve every issue related to transportation efficiency, they can be part of the solution by addressing chronic bottle-necks on key goods movement corridors, helping to bring stakeholders together to find common solutions, outlining long-term transportation plans, and providing necessary and predicable funding for plan implementation.

Government-industry advisory groups, councils and consultation boards are becoming a common feature of regional governments' programs oriented to goods movement. Successful examples can be found in the Canadian metropolitan areas of Vancouver and Montreal (see case studies on the following pages). Consultation and coordination with private stakeholders, agencies and departments of governments, and special interest groups with respect to freight can occur on several levels:

- Acquiring timely and useful data on goods movement trends;
- Working together to define a commercial transportation network for the area;
- Determining the need for infrastructure improvements;
- Harmonizing highway, railway, air and marine regulation and municipal policies;
- Improving the mutual understanding of the costs and benefits of enhanced freight service levels; and,
- Generating solutions to address environmental challenges, with emphasis on solutions that are embraced and proposed by the industry to resolve complex and growing problems (e.g. climate change) instead of heavy-handed regulation.

Existing forums for stakeholder collaboration in the GTHA include:

- **Southern Ontario Gateway Council (SOGC).** The SOGC was established to take a new approach to transportation planning in the southern Ontario region. Key members include all major ports, CN and CPR, the Toronto and Hamilton international airports, the trucking, railway and marine associations, GO Transit, and two courier companies. Although all modes of transport are represented on the council, requiring the council to develop solutions and programs that are multi-modal in character, a key priority of the council is to develop solutions for more efficient goods movement. The council also includes representation from several municipalities, the province, the federal government and industry associations. Key projects completed to date include an economic impact study, a strategic plan and a transportation outlook forum.
- **Other forums for collaboration.** Similar to the SOGC, the St. Lawrence and Great Lakes Continental Gateway and Corridor is an initiative of the governments of Canada, Ontario and Quebec, together with private industry. It has significant overlap with the GTHA.

Clearly, the RTP must find ways to bring together stakeholders through processes that overcome competing interests, find common ground between environmental advocates and business representatives, and, ideally, stimulate initiatives at the local level by participating in risk-sharing for innovative solutions. Recent efforts, such as the establishment of the SOGC has proven that governments and private sector organizations can, and will, work together if there is a certainty that the outcome will have an overall benefit for the local economy, environment or communities.

CASE STUDY: Greater Vancouver Gateway Council

Picture 9 : The Greater Vancouver Gateway Council works to enhance Vancouver's competitiveness with U.S. west coast gateways.

The **Greater Vancouver Gateway Council** is comprised of Voting Members (including: railways, the Port Authority, labour representatives, industry associations, Translink, BC Ferry Corporation, UBC Sauder School of Business and Vancouver International Airport Authority) and Resource Members (including: local, regional, provincial and federal government entities, the Western Transportation Advisory Council (WESTAC) and trade associations) under the honorary chairmanship of the Minister of Transport for the Government of Canada. The council has developed a plan for a Major Commercial Transportation System (MCTS) to address increasing road and rail congestion stemming from growth in Canada/Asia Pacific trade. Competitiveness with U.S. West Coast gateways is a key focus. This $6 billion initiative has attracted investment from the federal and provincial governments, as well as the private sector. Anticipated benefits would stem from increased business output (estimated at $1.5 billion/year) and 7,300 new permanent jobs.

The parties have agreed upon priorities and investment strategies that include:

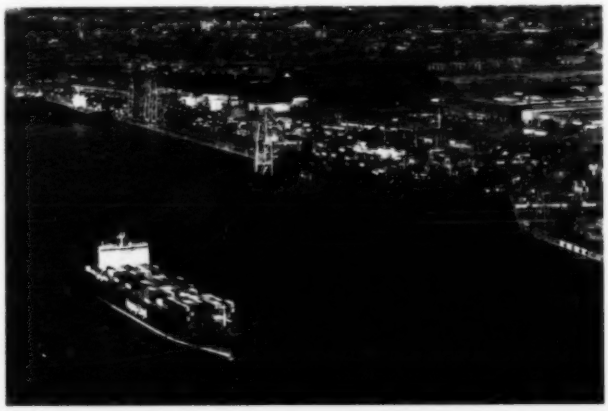
- Expanded use of local waterways and coastal marine operations for cargo movements;
- Rail system major capacity investments and system improvements; and
- Major road system capacity investments and upgrades for designated MCTS (commercial) routes.

Table 19 : CASE STUDY: Greater Vancouver Gateway Council

CASE STUDY: Greater Montréal – Inter-Regional Committee for Goods Transportation

In the Montreal metropolitan area, the Comité Interrégional pour le Transport des Marchandises (CITM, or Inter-Regional Committee for Goods Transportation) has developed a strategic action plan (Montréal par Quatre Chemins, or Montreal by Four Paths) for goods movement over the period 2001-2006. A five-year plan for 2007-2012 is due to be released soon.

The CITM was formed in 1999 with 70 representatives from all sectors: business; economic development agencies; labour unions; and federal, provincial, regional and municipal governments. The driving force comes from le Conseil regional des Élus (CRÉ) de Montréal (the Montreal Island Council of Elected Officials) and the CRÉs of its surrounding regions. Some of the key issues that provide a common focus for CITM members are highway congestion, conditions to support the development of the goods transportation industry, and the harmonization of goods transportation in the urban environment. The group's strategic projects include:



Picture 10 : The Inter-Regional Committee for Goods Transportation has developed a strategic action plan for goods movement in Greater Montreal.

- a Goods Transportation Observatory;
- an International Promotion Campaign;
- the establishment of Goods Distribution and Logistics Centres in the Montréal Region focusing on value-added activities such as final assembly, inspection, labelling and packing. These bring together the producers, marketers and providers of logistics services, as well as facilities for inspection, customs, transportation, brokering, warehousing, order-handling, etc. in bond (i.e. duty-free);
- the advancement of the concept of a trade corridor between Québec and New York.

One lesson learned from Montreal is to remain patient and persistent. Time and money are needed to establish credibility. The CITM achieved small successes that began the process of building confidence and trust among its stakeholders. Success built upon success with continuing strong leadership from regional governments and support from the provincial and federal levels.

Table 20 : CASE STUDY: Greater Montréal – Inter-Regional Committee for Goods Transportation

6.3 Information Requirements

The lack of data on goods movement is a key theme in almost every study on this topic. While recent efforts by MTO and others have helped to provide a better picture of goods movement activities in the GTHA, additional data collection efforts would assist in:

- quantifying the importance and significance of goods movement activities;
- providing for better-informed planning decisions;
- identifying existing and future network constraints;
- identifying opportunities for modal shifts or trip reductions;
- examining the impacts of proposed actions/options; and
- assisting the operators to make better real-time decisions.

Understanding what goods are moving in the GTHA, and to where they are moving, is a prerequisite to developing comprehensive plans for making goods movement more efficient and sustainable.

Improvements in data collection must be a joint effort between the public and private sectors. There are recent examples of using technology to collect data in a manner that protects private interests. It is these types of initiatives that have the greatest potential for success.

An independent data repository may also help to oversee data collection, similar to the Data Management Group (DMG), which was set up more than two decades ago to manage and maintain data from the *Transportation Tomorrow Survey*.

6.4 Alternative Scenarios and Potential Initiatives

Possible trends and government regulations and policies that conform to the existing situation may lead to truck routes and simplified restrictions for operators to schedule routes more efficiently and reduce environmental impacts. Special permit operations in congested areas may be used and enforced extensively for more types and sizes of trucks in built up areas.

Applying a variety of interventions, however, may lead to a very different application of regulations and policies. As an example, widespread adoption by municipalities of proximity by-laws and regional and provincial regulations to protect major corridors, nodes/gateways, and surrounding lands for compatible adjacent developments. Complementary restrictions on operations in residential and built-up areas could be tightened. The application of user-pay schemes, including capital operating and maintenance cost for infrastructure and increased Private-Public partnerships to manage core infrastructure for goods movement could assist in making capacity additions that are self-financed. Appendix A shows examples of the types of regulation and policy interventions that could create these circumstances.

OPTIONS FOR ACTION: MOVING GOODS AND DELIVERING SERVICES		
Regulations and Policies		
Trend Scenario	**Incremental Scenario**	**Bold Scenario**
Truck routes and restrictions are simplified for operators to schedule more efficiently and reduce environmental impacts. Special permit operations in congested areas are used and enforced extensively for more types and sizes of trucks in built up areas.	Proximity by-laws are adopted by most municipalities. Regional and Provincial regulations protect major corridors and surrounding lands for compatible adjacent developments. With that, restrictions on operations in residential and built up areas are correspondingly tightened.	User pay schemes including capital operating and maintenance cost for infrastructure dominate. Private-Public partnerships manage core infrastructure for goods movement and capacity additions are self-financed in the GTHA.

Table 21 : Regulations and Policies

7 Where Do We Go From Here?

7.1 Assessing the Alternatives

Integrating environmental and social measures with the economic mission of logistics activities will be an evolving process. Confidence and trust among participants needs to be established. For this reason, the emphasis in this Green Paper is to get involved in consultation processes to find common grounds for moving ahead. There are options on how to proceed, not whether to proceed.

The potential initiatives described in the previous sections indicate the intended criteria that each one should comprise. Specific goals for each criterion, balancing the three pillars of sustainability, would be addressed in such consultations. The framework of criteria would then evolve to assist in producing a concerted, collaborative plan to meet the challenges ahead.

7.2 Quick Wins

Previous studies and consultations in the GTHA constituent regions indicate that some areas can be addressed quickly. The goal in proposing quick wins for this Green Paper is connected to the longer-term objectives of a concerted plan. Establishing a basis for trust and a bias for action should pay off in the long run from all perspectives. Failure to achieve "buy-in" will invite serious peril for long-term growth prospects. The key foundation initiatives from above are repeated here:

- Actively engage in industry consultations to facilitate goods movement planning and sharing of data. Forums exist in the region, such as the SOGC. This is a good starting point. Traffic flow and congestion, safety and security, economic development, and environmental sustainability are issues to address in this initiative.
- Establish a regional working group to develop a strategy on the location and design of large-scale logistics facilities.
- Set up a research organization to gather and share data, as well as study and propagate technology, in the siting of facilities, routing, loading and communications.
- Study the necessity of protecting rail corridor for future freight use.
- Cooperate with trade gateway and corridor initiatives of industry working with the provincial and federal levels of government. This would relate to freight and passenger corridors and projecting future land requirements. The longer-term potential of such actions could extend to something of the scale of Vancouver's MCTS or Chicago's CREATE.

Potential quick wins in goods movement may include:

- Support measures to increase system efficiency and competitiveness, for example, examining a proposed long combination vehicle trial in the Ontario/Québec Corridor.
- Develop and implement detailed freight supportive land-use guidelines focusing on land use and value, noise and vibrations, traffic flow and congestion, and safety and security. This can be based on recent work by the Ministry of Transportation of Ontario.
- Investigate the adoption of the FCM/RAC guidelines on rail proximity for the GTHA. These guidelines address harmony between economic, environmental and social goals.
- Develop common criteria and approaches for designating truck routes and create a GTHA-wide truck route network. The focus would be on safety and security, traffic flow and congestion, and noise and vibrations, keeping in mind the economic consequences of policy options. A key goal is consistency.
- Collect information on trip generation and attraction and preferred routing for use in transportation planning and modelling and to minimize conflicts with public transit.
- Encourage a pilot program to evaluate the feasibility of using lock boxes to enable goods to be delivered to a centralized location in off-peak hours by truck with the last leg being carried out by end customers as part of other errands. This might be considered as the enhancement of a model currently being used by courier services in the GTHA business districts.
- Develop a pilot to centralize construction site deliveries for large-scale projects.

Appendix A: Potential Initiatives

	Initiative
Land-Use	
LU1	• Adopt, adapt and apply the FCM/RAC Guidelines on rail proximity to the GTHA
LU2	• Develop and apply similar proximity guidelines for major truck routes
LU3	• Base location decisions for new industrial uses on minimizing transportation effort, and provincial policy and plans
LU4	• Use land-use policies and public funds to develop the strategic assembly of lands near key goods movement hubs
LU5	• Develop under-utilized brown fields for logistics, industrial and manufacturing uses in a manner that is sensitive to surrounding uses
LU6	• Require all new manufacturing and industrial developments to submit a "freight impact study" as part of the approvals process, including climate change impacts
LU7	• Establish freight villages adjacent to intermodal hubs so that transport-intensive industries can choose the most efficient mode by time and cost
LU8	• Encourage private companies to take advantage of strategically located shared distribution centres
LU9	• Establish freight villages adjacent to intermodal hubs so that transport-intensive industries can choose the most efficient mode by time and cost
Infrastructure	
I1	• Implement Private-Public partnerships to invest in additional rail and road capacity for trunk routes and regional arterial connectors
I2	• Industry and governments, using the trade gateway and corridor initiatives of the provincial and federal levels of government, jointly develop infrastructure initiatives to enhance and protect freight and passenger corridors and to project future land requirements
I3	• Expand road tolls to key facilities and provide reduced rates for trucks in off-peak hours
I4	• Develop an east-west toll truck route through the GTHA; through-trucks are required to use this route
Operations	
O1	• Establish a pilot program to test the feasibility of using lock boxes to enable goods to be delivered to a centralized location in off-peak hours by truck, and picked up by end recipients
O2	• Provide seed money to establish UDCs in dense areas. Local movement is filtered through these UDCs
O3	• Have the various industry actors and stakeholders propose solutions to resolve the various efficiency, social and environmental issues identified earlier

	Initiative
O4	• Create a fund to provide seed capital for small entrepreneurs to launch innovative services that are aimed at improving freight efficiency in dense urban areas and reduce the environmental impacts of goods movement
O5	• Develop a system to coordinate truck deliveries; one possibility is to have truck trips pre-registered and assigned a timeslot within which they can arrive, optimizing timeslots to minimize bottlenecks and congestion
O6	• Use information systems to identify load consolidation opportunities between shippers
O7	• Encourage innovative methods of goods movement, such as placing goods on light rail vehicles
O8	• Lock boxes are distributed throughout higher-density areas, allowing goods to be picked up by end recipients
Use of Technology	
T1	• Equip trucks with speed limiting devices to maximize fuel efficiency and ensure safety
T2	• Implement programs to collect data on truck movements using GPS
T3	• Establish mechanisms so that private companies regularly collect and share information on freight movements — but do so anonymously to ensure the protection of corporate information
T4	• Develop the concept of establishing and supporting a data warehouse for goods and services movement information, with inputs from all stakeholders in transportation services
T5	• Use real-time public systems to consolidate local movements and optimize total system logistics costs
T6	• Implement a suite of technologies to monitor traffic, enable tolling and allow dynamic route/mode selection for shippers and drivers
Regulations and Policies	
RP1	• Develop and use common criteria and approaches for designating truck routes by municipalities and regional agencies to create an integrated GTHA-wide truck route network
RP2	• Establish a formal mechanism for interaction between governments and industry, possibly using the SOGC or other institutions
RP3	• Require operators of heavy goods movement vehicles to share information on location, speed, and other attributes
RP4	• The establishment of Goods Distribution and Logistics Centres focusing on value-added activities such as final assembly, inspection, labelling and packing, with the potential to expand to bring together producers, marketers and providers of logistics services, as well as facilities for inspection, customs, transportation, brokering, warehousing, order-handling etc.

Table 22 : Appendix A: Potential Initiatives

Appendix B: Photo Credits

Picture 1	Truck – upper left	Sean [Flickr account Skez], under the terms of an Attribution-Share Alike Creative Commons license.
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Picture 7	Real-time road information sign board	Tomitheos, image presented with photographer's authorization.
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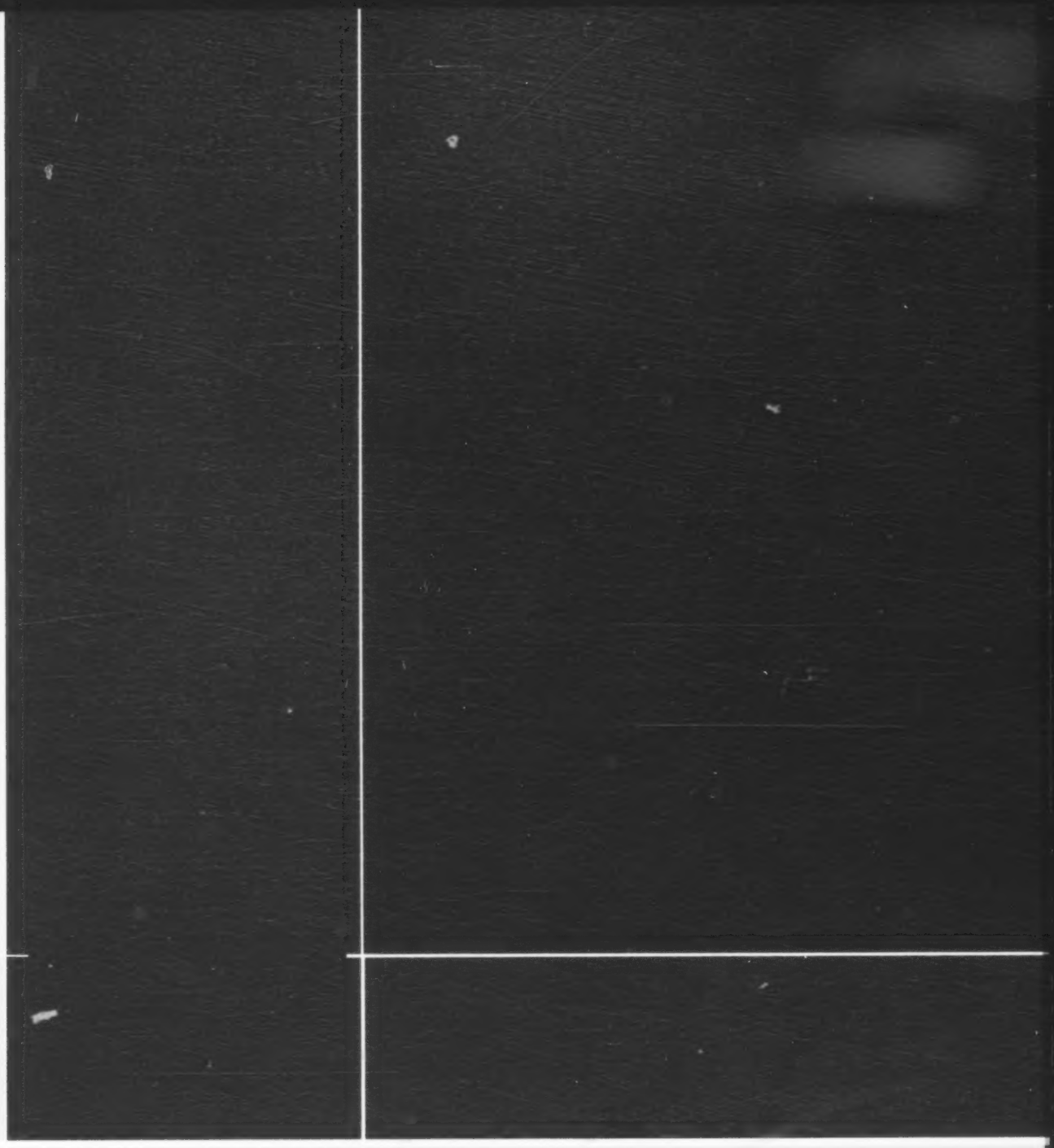
Picture 9	Greater Vancouver Gateway Council - coastal gateway bridge	Mike [Flickr account SqueakyMarmot], under the terms of an Attribution Creative Commons license.
Picture 10	Greater Montreal – Inter-Regional Committee for Goods Transportation: goods movement via laker in Montreal port	Graham Richardson, image presented with photographer's authorization.

Table 23 : Appendix B: Photo Credits



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